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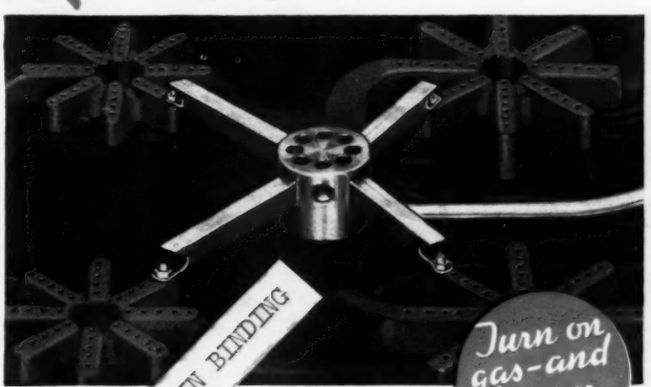
THE NEW Rutz o matic LIGHTER



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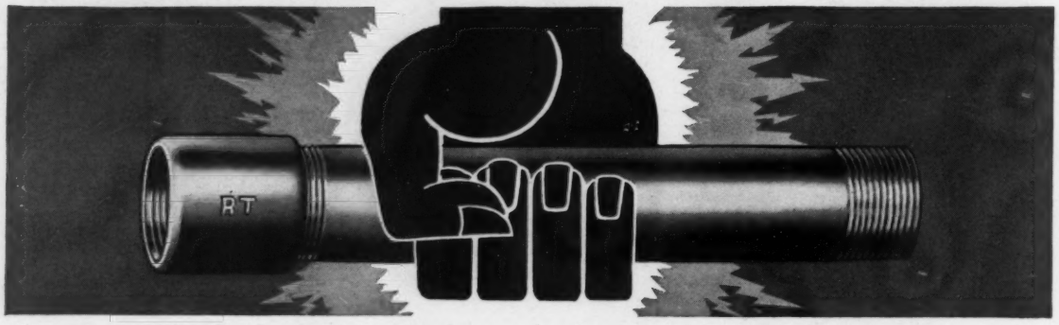

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This new pipe is the result of combining a wonderful welding process with a material that is a metallurgical triumph. It totals the advantages of electric welding with the quality of a long-lasting alloy of refined iron, copper and molybdenum. It boasts a weld that is 100% as strong as the pipe wall. It is perfectly round, of uniform wall thickness and free from scale inside and outside. It resists corrosion, standing first in this respect among the ferrous metals, after the stainless irons and steels.

Industry will find many uses for Republic Electric Weld Toncan Iron Pipe. "Hot spots" in pipe lines, sludge lines in refineries, condensate lines in power plants, process liquor lines in chemical plants, all these and many other classes of service where corrosion is severe and where a perfectly welded pipe is a necessity will show operating savings when this new pipe is installed.

Let us tell you where Republic Electric Weld Toncan Iron Pipe will work to your advantage—and show economy.

REPUBLIC STEEL CORPORATION

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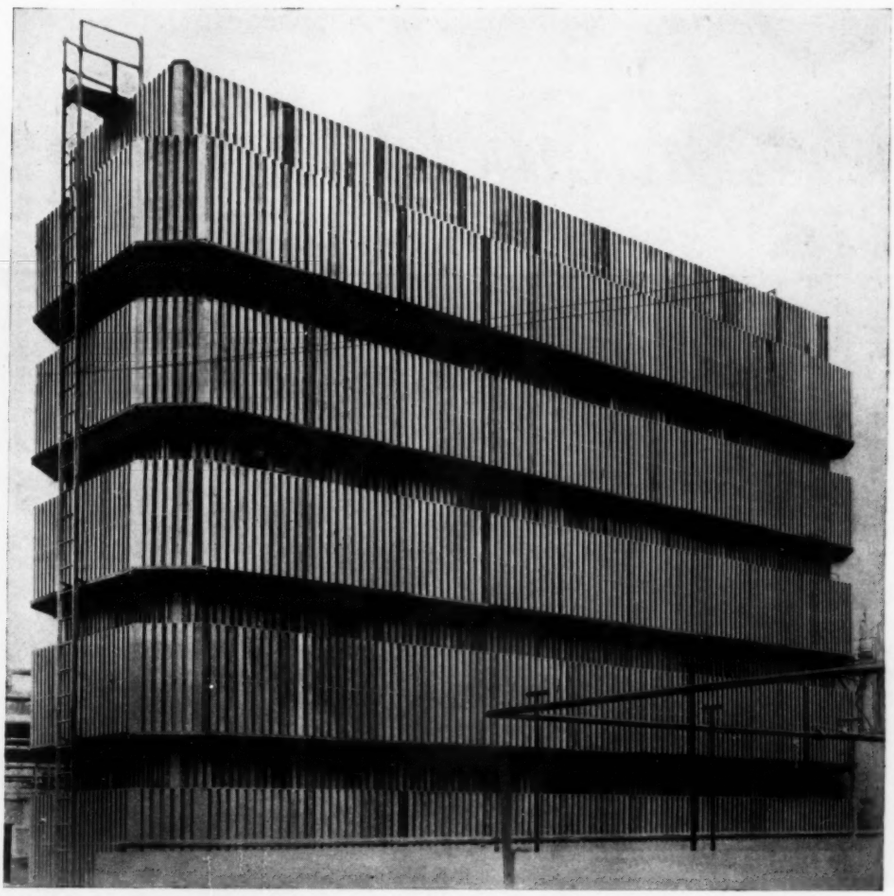
Unretouched photograph showing recent installation of a new, Fluor Aerator-type Cooling Tower at an Oklahoma Oil Refinery where limited room and nearness of equipment make POSITIVE SPRAY ELIMINATION *distinctly advantageous.*



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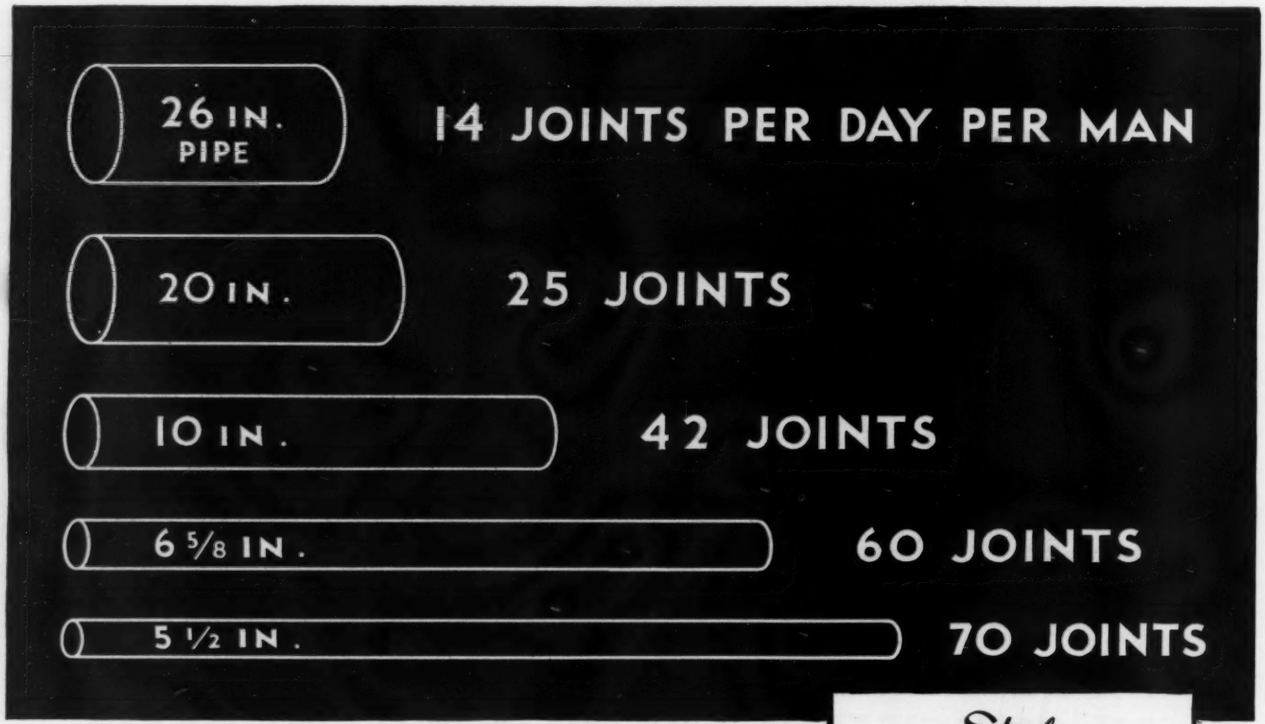
prove Lindewelding is faster—



THIS chart shows the average number of joints per day produced by each welder on five new Lindewelded lines.

It reflects the 30 to 60 per cent saving in time which Lindewelding makes possible.

Lindewelding is a new and better method of oxy-acetylene welding. It makes stronger joints with 35 to 40 per cent less material. It increases the speed of experienced welders and can be learned efficiently by beginners in a shorter time.

Procedure controls for Lindewelding are available to all users of Linde Oxygen. Write to the nearest Linde district office for complete information today.

Study Lindewelding Technique in this Motion Picture

The new motion picture, "The Lindeweld Process for Pipe Line Construction," shows every detail of Lindewelding technique, which differs from neutral-flame welding technique in that it employs a special rod, a special flame adjustment, and the "backhand" method of blowpipe manipulation. Pipe line officials and welding or engineering societies may borrow this picture free of charge by writing to any Linde District Office. It is furnished in 16 mm. and 35 mm. safety film.

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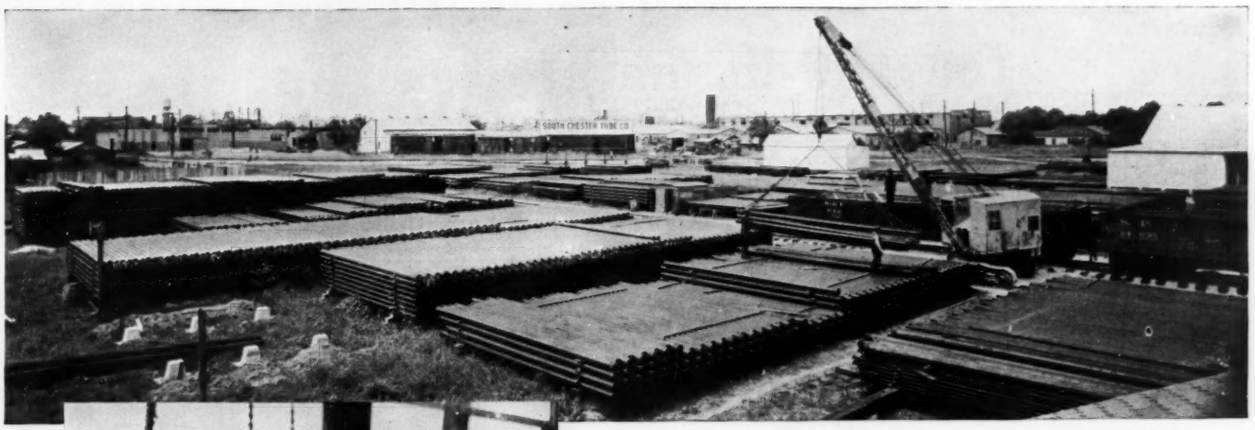

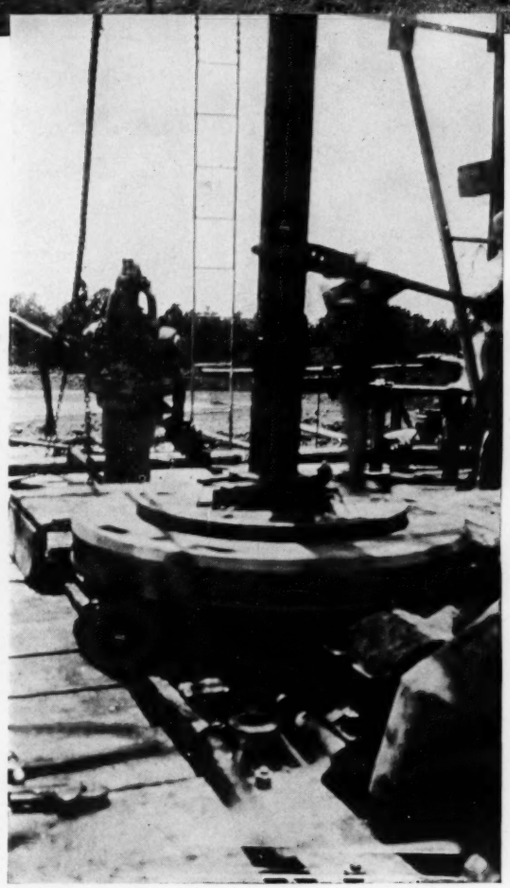

The above photo is a panoramic view of the South Chester stock yard at Houston, Texas.

This picture shows more clearly than words the large, complete and accessible stock of casing and tubing that will meet quickly and fully any demand from the field.

★

Casing delivered from the above stock yard has been used in a large percentage of East Texas drillings. At the left is a typical scene from that field showing some "Chester" casing being run in.

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MONO-CAST DOUBLEX SIMPLEX PIPE

chosen in competition with steel pipe for 100-lb. natural gas line

THE Chief Engineer of a large midwestern city recently carefully considered two types of construction for a 10-inch pipe line 4 miles long to carry 100 lbs. natural gas pressure. The choice lay between coated, wrapped steel pipe as against mechanical joint cast iron pipe. After mature deliberation, Mono-Cast Doublex Simplex Cast Iron Pipe was selected. According to the Chief Engineer, the selection was based on the following considerations:

1. Initial cost of the Doublex Simplex cast iron pipe compared very favorably with the cost of a coated and wrapped, welded steel pipe.

2. Mono-Cast Doublex Simplex Cast Iron Pipe requires no welders or other especially trained men, and no elaborate equipment.

3. The soil through which the line was to be laid is generally considered corrosive; since Mono-Cast Doublex Simplex Pipe has high native resistance to corrosion, it was felt that this material promised the lower maintenance cost.

4. Although the terrain was rolling, it was felt that the high degree of deflectability provided in the Doublex Simplex (gland-packed) Joint would overcome these difficulties.

Laying records on this job, plus the fact that the line tested gas-tight, fully justified the selection. The entire 4-mile line was laid in two weeks time, using local labor totally inexperienced with Doublex Simplex Pipe.

Address Acipco office nearest you for details on this pipe

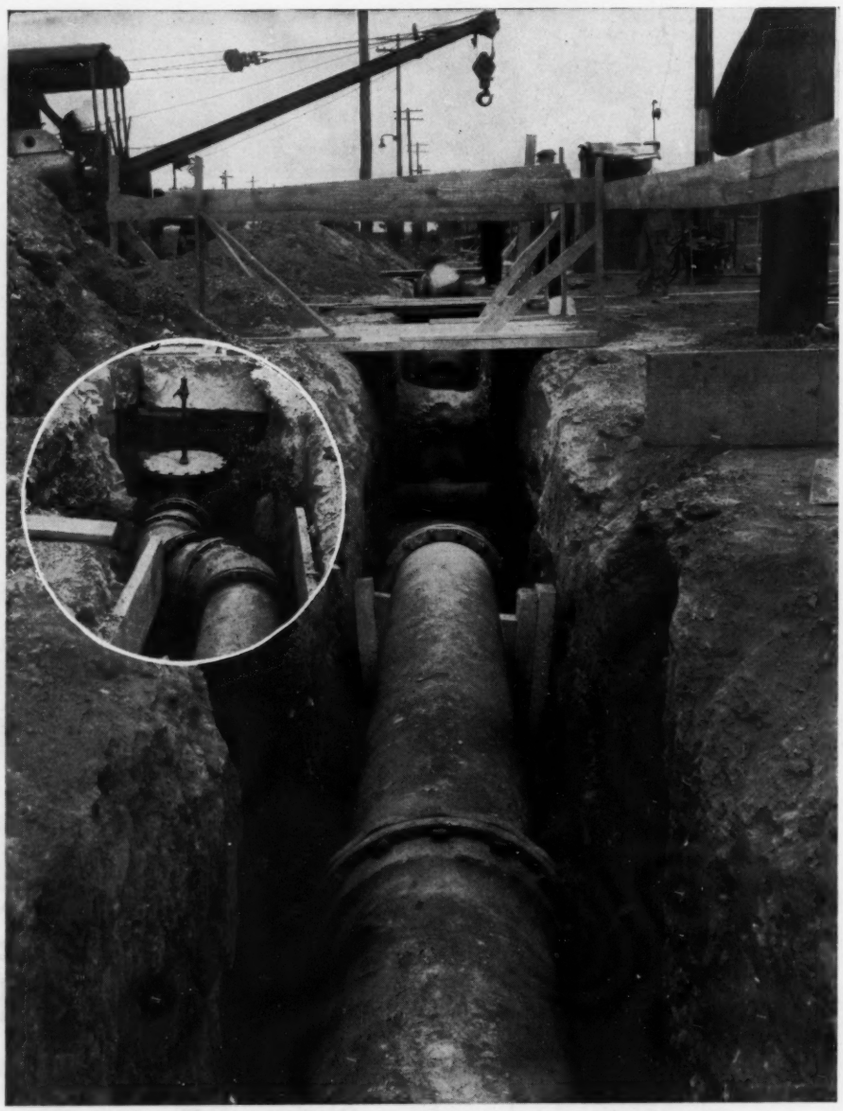

Photo shows part of a line of 20-inch Mono Cast Doublex Simplex Cast Iron Pipe installed for gas service by the Philadelphia Gas Works Co., Philadelphia, Pa., in May, 1932. Inset shows one of the Drip Pots in the line.

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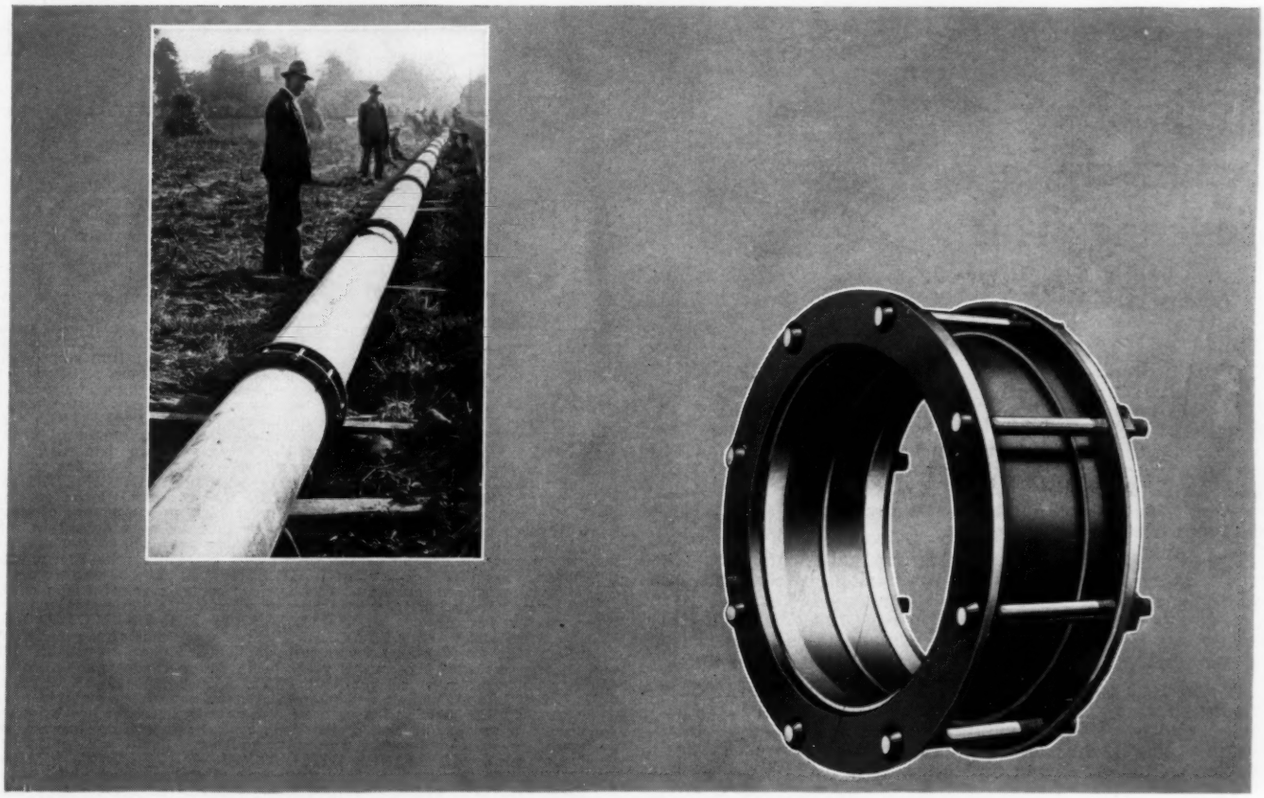

To the inherent flexibility of a coupled joint, Dayton Couplings add the strength of all-steel construction. Once installed on a pipe line, Dayton Couplings become a stable investment in permanent and unfailing service. As long as the Dayton-coupled line is in use, all connections remain strong and flexible, absolutely tight and leak-proof.

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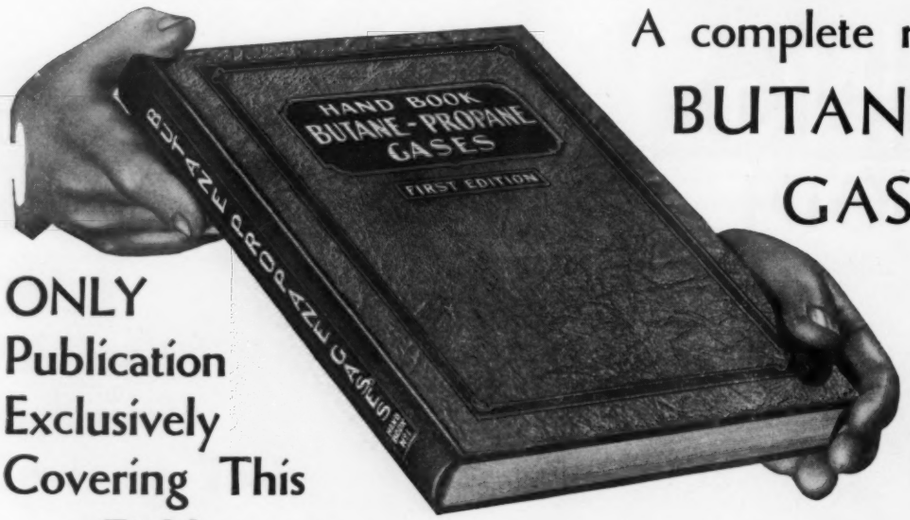

ONLY Publication Exclusively Covering This Field

THIS Handbook comes in response to a very definite need. A tremendous amount of development work has been accomplished for the liquefied petroleum gas industry in a brief space of time, with many companies participating. And to date there has been no one source to which the industry could go for information on all phases of the field. This is the mission of the *Handbook of Butane-Propane Gases*—consolidating and organizing all of these reference data under one cover.

The editors have established close contact with all branches of the liquefied gas industry—production, bottled gas and town plant distribution, gas enrichment—and to assure a high standard of technical excellence for the Handbook leading figures in the industry have extended their cooperation as contributors.

In the next column contents of the *Handbook of Butane-Propane Gases* are reviewed. No phase of the field is neglected, and every major subject heading is treated in detail, making the Handbook an outstanding reference work. Numerous tables, charts and illustrations add to its value.

Advance orders for the Handbook have poured in from all sections of the United States, and from several foreign countries, since the first announcement of its compilation—indicating again the need for this publication and the growing interest in butane-propane service. A limited printing makes it imperative that you place your order now. Use the coupon below.

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A CHRONOLOGY OF LIQUID GAS DEVELOPMENT: Beginnings with Blaugas; first liquid natural gas sets; early industrial uses; expansion in domestic marketing; history of equipment; butane plant designs of early days. **PHYSICAL PROPERTIES OF THE LIQUEFIED PETROLEUM GASES:** Table of constants; discussion of general characteristics; vapor pressures; viscosity; specific gravities; combustion data; dew points of the pure gases carburetted with air; mean specific heats. **PROPERTIES OF BUTANE-PROPANE MIXTURES AND RELATION OF PROPERTIES TO TEMPERATURES:** Calculation of properties; calculation of vapor pressures; evaporation of mixtures; calculation of relative quantities evaporated; dew points of mixtures. **COMPOSITION AND ANALYTICAL DETERMINATION OF LIQUEFIED PETROLEUM GASES:** Specifications for commercial grades of propane and butanes; conventional gas analytical tests; low temperature fractionation analysis; description and operation of apparatus; calculations for liquid analysis; automatic operation; interpretation and computation on basis of low temperature fractionation analysis results. **THE MANUFACTURE OF LIQUEFIED PETROLEUM GAS:** Methods and processes in the natural gasoline industry; plant flow scheme for liquefied petroleum gas production; single column rectification; double column rectification with a finished gasoline from the primary unit; double column rectification with finished gasoline from secondary column; weathering; blending; handling from storage. **TRANSPORTATION OF LIQUEFIED PETROLEUM GASES:** Physical properties; grades of product; I.C.C. regulations; Reid method for vapor pressure determination; shipping in cylinders; tank car shipments; transportation by motor truck; pipe lines for butane; water transportation. **THE USE OF BUTANE AND PROPANE WITH MANUFACTURED GAS:** Calculations; enrichment of manufactured gas transmitted under high pressure; use of propane to meet peak loads; use of butane or propane as a substitute for gas oil for the carburetion of carburetted water gas; use of propane or butane for heating gas underfired coke ovens to reduce coke production. **CENTRAL PLANTS FOR BUTANE-AIR SERVICE:** The butane-air process; liquid storage; vaporization; carburetion; control; dehydration; odorization; gas storage; distribution; burner adjustment; conversion plants; representative flow sheets. **CENTRAL PLANTS FOR UNDILUTED BUTANE-PROPANE VAPOR SERVICE:** Field of usefulness of the undiluted vapor system; specifications for a suitable liquefied gas; estimating size and characteristics of the central plant load; design of gas plant; design of distribution system. **LIQUEFIED PETROLEUM GASES AS INDUSTRIAL FUELS:** Unloading and storage system; vaporizing system; mixing system; plant distribution system; atmospheric burners; low pressure combustion systems; diffusion combustion; typical applications; conversion problems, gas-fired equipment; conversion problems, liquid and solid fuel-fired equipment. **APPLIANCE UTILIZATION OF LIQUEFIED PETROLEUM GASES:** Combustion of propane, butane and commercial mixtures of these gases; burner orifice capacities; capacity of service pipe and house piping; general requirements for burners of all domestic appliances; gas ranges; space heaters; water heaters; lighting fixtures; draft diverters; cost of commercial propane compared with natural gas, manufactured gas and electricity. **BOTTLED GAS DISTRIBUTION OF LIQUEFIED PETROLEUM GASES:** The bottled gas field, present and future; equipment for bottled gas service; units engaged in distribution; economics of two-drum distribution; one-drum distribution; customer contracts; lease of equipment; selling through agents; sale by local agent; essentials in permanent market building; National Bottled Gas Association's tentative code of marketing practices; Underwriters' regulations relating to equipment and installations. **MISCELLANEOUS:** Table of flow of gas at low pressure through pipe lines; National Fire Protection Association's regulations pertaining to liquefied petroleum gas systems, other than those using portable containers. **CATALOGUE SECTION:** Detailed information on products designed for butane-propane service. **BUYERS' GUIDE:** A commodity listing of firms supplying equipment, appliances or services for the liquefied petroleum gas industry. **DIRECTORY OF CENTRAL PLANTS; BIBLIOGRAPHY; INDEX.**

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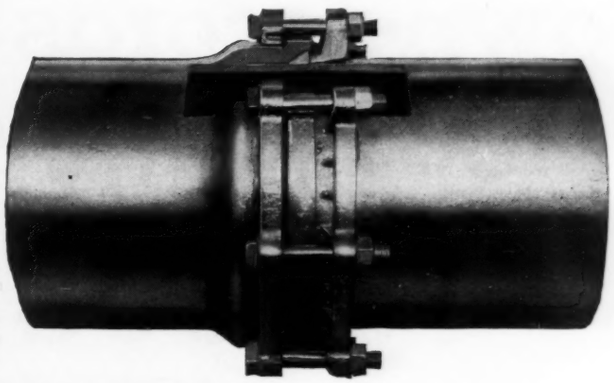

The Gas-Tight Anthony Joint

If you have used Anthony Joint pipe you know that it saves time. There are only 3 parts to assemble — 6 bolts to tighten — and the joint is complete.

If you have tested the Anthony Joint you know that it is gas-tight under pressures that exceed the average daily pressure on the line.

But whether or not you have had experience with the Anthony Joint you are undoubtedly familiar with the engineering principle on which it is based—the "stuffing-box" principle. Engineers recognize that wherever a moving part enters a pressure chamber the "stuffing-box" principle is universally applied to prevent leakage. It is adapted in the Anthony Joint through the use of a rubber gasket with follower and clamp rings.

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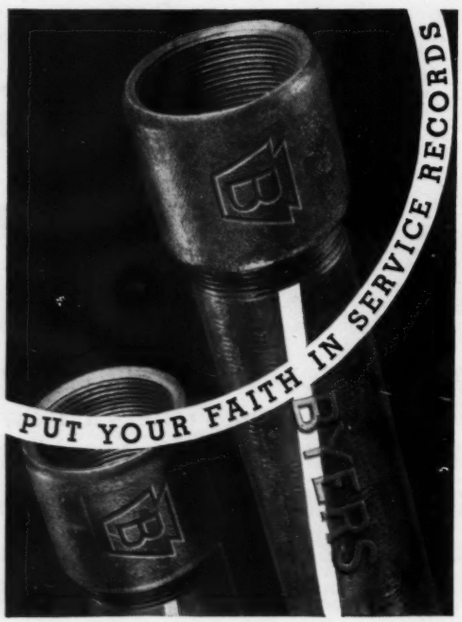
The GAS INDUSTRY'S own records *prove* the economy of BYERS WROUGHT IRON



BASED on two outstanding advantages, Byers Genuine Wrought Iron Pipe has served the gas industry for 68 years—and served well.

First, the reputation of Byers Wrought Iron Pipe for exceptional resistance to corrosion, especially soil corrosion, grew up with the gas industry. And now, in addition, this same corrosion-resistance reputation is recorded in oil and water works history as well.

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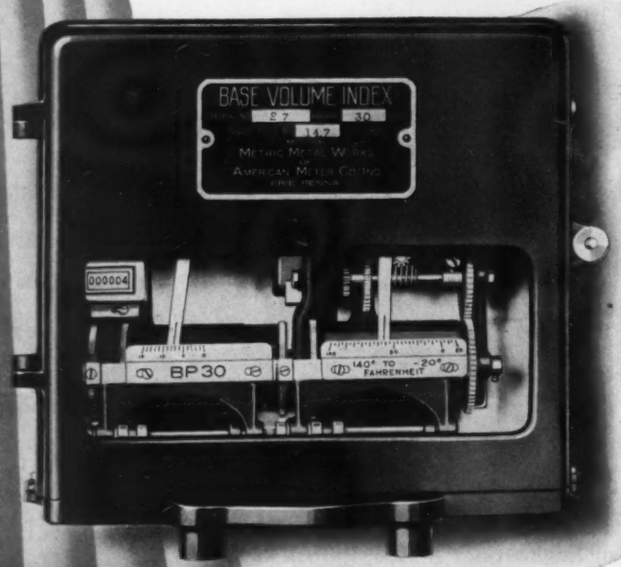
TOTALIZES

TO GIVE STRAIGHT READING

CHART record readings are no longer a necessary factor in the determination of volume in standard units as measured by high pressure positive displacement meters.

THE METRIC BASE PRESSURE INDEX, for instance, automatically multiplies the quantity of gas passing through the meter, at pipe line conditions, by the factor of the line pressure divided by the base pressure and registers the resultant on a straight reading index.

THE METRIC BASE VOLUME INDEX multiplies the volume passing through the meter, by the pressure factor and subsequently by the temperature factor so that the volume indicated by the counter index is the volume in standard units.



Any Volume and Pressure Gauge supplied by American Meter Company can readily be installed on the top of the base pressure index or base volume index (see illustration above at right). The chart serves as a permanent record of the rate of flow and pressure, and can also be used as a check reading when desired.

However, the integrating mechanism can be trusted with all calculations, and periodic increments in the index reading are obtained without dependence on clutches or other non-positive devices. The same index is used for all meters, the only variation being in the base plate.

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Los Angeles New York Pittsburgh Philadelphia San Francisco

Pacific Meter Works, San Francisco—Los Angeles

December, 1932

WESTERN GAS

Vol. VIII, No. 12

"Reg. U. S. Pat. Off."

A Monthly Journal of the Gas and Gas Appliance Industries in *Western America*

Review of the Month

Base Predictions Upon Something Concrete

As the somewhat dubious year of 1932 moves to a close, business thought everywhere is revolving about one question: what will be the trend in the new year?

No forecast which pretends to answer this question definitely will be accepted without challenge; business has grown tired of guesses, and of guessing.

Perhaps the best tonic for gas men is to look about them as 1933 approaches, to discover whether they, and the rest of the industry, have built up any momentum to carry the new year ahead at a more normal level. News columns of the current *Western Gas* supply at least a limited picture of what is taking place in the industry. Without exaggeration it may be stated that the past few weeks have brought more reports of encouraging nature to light than for any period since the first of the year. While a number of companies can show an increased earning for the year to date, earnings will of course be down for the industry as a whole—but not drastically so. The year has also seen a recession in appliance sales, but here again numerous companies may be pointed to which have built new load in real volume. Under the head of expansion in service area the year past has seen but few new gas line developments which are at all comparable in size to those launched in 1928-1930. However, a steady process of integrating the distribution territory available to these large systems has been noticeable all year. This issue reports not one, but many examples of such line construction.

To bring this backward glance away from the general to the specific, some of the impressive items in today's news are briefly digested in the following paragraphs.

Gas Line Construction: From fields in Boyle County, Kentucky, to Danville, Kentucky, a line for Kentucky Utilities Co. A 20-mile line to supply Eden, Texas, serving numerous other communities through laterals to be built by Southwestern Gas & Pipe Line Co. Extension from Indiana Gas Distributing Co. line to Dana, Ind. Work under way to serve Cameron, Mo., through a 20-mile line from fields near Smithville. Standard Gas Co., Inc., capitalized to lay a 25-mile line to Nashville, Tenn., from fields in Dickson County. Work to begin in spring on line to serve suburbs of Peoria, Ill., from the Peoria lateral of Panhandle Eastern Pipe Line Co.'s main line. To 13 Kentucky towns, line planned by Kentucky Public Service Co., Inc.

Load Building Activities: Many companies are closing the year with an aggressive job of load building behind them. That this effort has brought correspondingly increased dealer sales goes without saying, particularly since practically every major company now includes the dealer prominently in its sales planning. Results speak for themselves: Community Natural Gas Co. replaced 200 electric ranges and 90 electric water heaters on its Texas system up to the middle of October, selling in all 659 ranges and 440 water heaters thus far in the year. San Diego Consolidated Gas and Electric Co. has inaugurated a complete sales program along with its introduction of natural gas. Wisconsin Public Service Corp. sold 225 gas ranges in a recent 60-day campaign, in Milwaukee. The Northern States Power Co. closed 371 domestic gas contracts in September plus 35 industrial and commercial contracts. Gas Service Co. subsidiaries in the Middle West carried on their usual year-round selling drive and found that large results can be expected from proper effort. From January 1 to the end of October some of the results ran as follows: furnaces, boilers and conversion burners, 939; large size space heaters, 1030; radiant heaters, 1528; domestic ranges, 3272; water heaters, 1521; laundry equipment, 714—these being but a few of the larger totals.

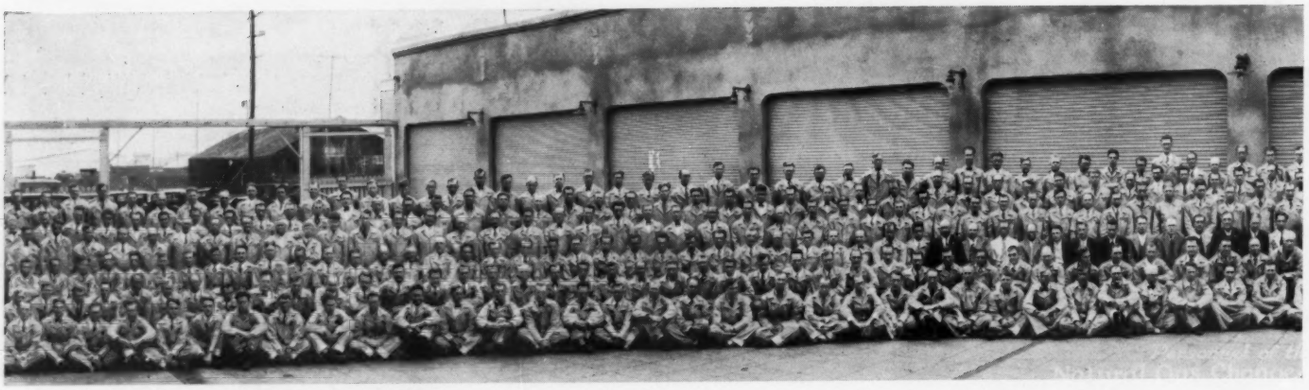
Franchising and New Turnons: In this issue are reported the granting of 12 franchises and the assigning of 3 additional franchises; two of these involved central plant butane-propane service. In the same issue is recorded the beginning of service in 10 communities—all within the past two months, evidence of a decided renewal in this direction.

Taxes, Rates, in Municipal Ownership Centers

Official records from Minnesota, published in November, compare 20 towns having municipal electric plants with 20 where plants are privately owned. Taxes, rates and net city debts average 70 per cent higher in the municipal ownership towns. In the same vein, Detroit last month voted down a gas line proposal involving the passage of municipal bonds for a city-owned transmission line.

Interpretation of Oklahoma Merchandising Law

A November opinion handed down by the Attorney General's office in Oklahoma brings sharply into question the validity of the anti-utility merchandising statute passed last year in that State.



Advance Planning and Full Departmental

San Diego Change-

WHEN a manufactured gas company arrives at the decision to introduce straight natural gas into its system it inaugurates at once a three-fold operation. A natural gas change-over, made with an eye to full customer satisfaction and a sustained level of company earnings, must include these essential steps:

1. A public informational campaign.
2. The physical task of adjusting distribution system and customers' gas-burning equipment to the new fuel.
3. The organization of load-building forces, to add revenue which will offset losses due to the greater calorific value of natural gas.

These three all-important phases have arisen in every major changeover which has taken place since natural gas began its replacement career. The San Diego change-over from 550 B.t.u. oil gas to 1100 B.t.u. natural gas, completed October 28, was no exception to the rule. Each change-over operation, however, presents a new set of circumstances, making the problem always a new one distinct to the local territory; the San Diego change-over therefore, like those of Denver, Salt Lake City, San Francisco, Chicago, and others which past issues of *Western Gas* have recounted, is a story well worth the telling. New solutions were in cases found to old situations; angles of the task perhaps not encountered before were presented and met.

How the San Diego Consolidated Gas and Electric Company marshalled its forces and successfully contacted 62,000 premises, adjusting 175,000 appliances through a freshly-schooled crew of 500 workers, in a 60-day period, is related in some detail below. The three major phases set forth above are presented in order, though all three naturally proceeded simultaneously with every department of the company making some contribution to the success of the undertaking.

COOPERATION of several members of the San Diego Consolidated Gas and Electric Corp. staff in furnishing information for this review of the San Diego natural gas change-over is acknowledged with appreciation. D. H. Perkins, superintendent of gas distribution, who had direct supervision over all physical change-over operations, provided the facts on this phase; F. M. Raymond, advertising manager, outlined for the writer the course of the informational campaign; R. J. Phillips, engineer in charge of gas sales, gave the load-building side of the picture. Thanks are also due the publicity department of Byllesby Engineering and Management Corp., of which Jos. W. Hicks is director, which extended its facilities in making data available for the article.
—EDITOR.

Natural Gas — The Perfect Fuel

Natural Gas News

Published by San Diego Consolidated Gas and Electric Co.

SAN DIEGO, CALIFORNIA, AUGUST, 1932

HOW NATURAL GAS WILL BE TURNED INTO CITY MAINS

DISTRICT PLAN USED AS SIMPLEST METHOD

Residents of Each District to Be Notified in Advance of House to House Adjustments

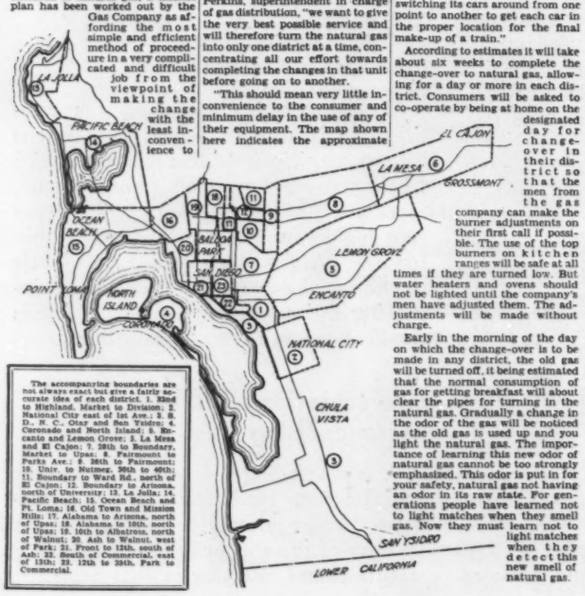
For the change-over from manufactured to natural gas, a district plan has been worked out by the Gas Company as affording the most simple and efficient method of procedure in a very complicated and difficult job from the viewpoint of making the change with the least inconvenience to the 60,000 users of gas in San Diego city and county who will be served with the new fuel for the first time in September.

"Although we expect to have between 400 and 500 men trained for the work and ready to go from house to house and make such burner adjustments as are necessary for using natural gas," said D. H. Perkins, superintendent in charge of gas distribution, "we want to give the very best possible service and will therefore turn the natural gas into only one district at a time, concentrating all our effort towards completing the changes in that unit before going on to another.

"This should mean very little inconvenience to the consumer and minimum delay in the use of any of their equipment. The map shown here indicates the approximate boundaries of each district. Residents in each unit will be notified when their district is to be changed over. The order, in which the districts are taken will not indicate any preference but be governed entirely by our facilities for routing the new fuel to its destination. Our problem is a good deal like a railway which must clear its tracks by switching its cars around from one point to another to get each car in the proper location for the final make-up of a train."

According to estimates it will take about six weeks to complete the change-over to natural gas, allowing for a day or more in each district. Consumers will be asked to co-operate by being at home on the designated day for change-over in their district so that the men from the gas company can make the burner adjustments on their first call if possible. The use of the top burners of kitchen ranges will be safe at all times if they are turned low. But water heaters and ovens should not be lighted until the company's men have adjusted them. The adjustments will be made without charge.

Early in the morning of the day on which the change-over is to be made in any district, the old gas will be turned off, it being estimated that the normal consumption of gas for getting breakfast will about clear the pipes for turning in the natural gas. Gradually a change in the odor of the gas will be noticed as the old gas is used up and you light the natural gas. The importance of learning this new odor of natural gas cannot be too strongly emphasized. This odor is put in for your safety, natural gas not having an odor in its raw state. For generations people have learned not to light matches when they smell gas. Now they must learn not to light matches when they detect this new smell of natural gas.



The accompanying boundaries are not always exact but give a fairly accurate idea of each district. 1. 32nd to Highland, Market to Division; 2. National City east of 1st Ave.; 3. S. D., N. C., Otay and San Ysidro; 4. Coronado and North Island; 5. Rancanio and Lemon Grove; 6. La Mesa and El Cajon; 7. 28th to Boundary, Market to Upas; 8. Fairmount to Parks Ave.; 9. 28th to Fairmount; 10. Univ. to Nutmeg, 30th to 40th; 11. Boundary to Ward Rd., north of El Cajon; 12. Boundary to Arizona, north of University; 13. La Jolla; 14. Pacific Beach; 15. Ocean Beach and Pt. Loma; 16. Old Town and Mission Hills; 17. Alabama to Arizona, north of Upas; 18. Alabama to 10th, north of Upas; 19. 10th to Albatross, north of Walnut; 20. Ash to Walnut, west of Park; 21. Front to 12th, south of Ash; 22. South of Commercial, east of 13th; 23. 12th to 28th, Park to Commercial.

AT LEFT:

A "change-over" newspaper reached every consumer. This issue reproduced the map of change-over districts.

THE INFORMATIONAL CAMPAIGN

The goal held up for this phase of the change-over effort was an informed pub-

Coordination Put Efficiency into Procedure for

over *to* Natural Gas

By GEORGE H. FINLEY

Editor
Western Gas

lic, convinced of the desirability of natural gas, and anxious to cooperate in eliminating accident hazards throughout the work. Publicity was regarded as a major operation. It was recognized that unusual cooperation from the daily press would be necessary; but limitations of the newspapers, from a standpoint of reaching every customer with a definite message at a definite time, brought the decision to establish a special consumer medium. A monthly company newspaper, "Natural Gas News," was therefore inaugurated and mailed to every customer—its first issue appearing two months before the change-over operations started.

"Natural Gas News" is a four-page 7 x 10-inch, three-column, newspaper-style publication. It is well illustrated, and its editorial treatment is strictly of the "news" variety. First issues featured stories both general and specific in nature, but all leading up to the work of change-over. A few sample headlines from the opening issue were: "380-mile Pipeline to Bring New Fuel"; "Emergency Plant to be Maintained"; "Romance of Natural Gas"; "Company to Adjust Stove Burners Free"; "Will My Gas Bill be Cut Down?"

In the second issue, sent out 30 days ahead of change-over, some of the features were: "District Plan Used as Simplest Method"; "How New Rates are Established for Natural Gas"; "Must Learn Smell of Natural Gas"; "Who Owns the Gas Company?"

For the third issue, mailed to arrive a day or two before natural gas was turned into the first zone, definite information of the "do and don't" type was prepared. Through cartoons and text the housewife was instructed to use only the top burners of her stove (and not to use other appliances) following the arrival of natural gas, until adjusters reached the home.

The same sort of instructions were sent in post card form to each resident two days ahead of natural gas.

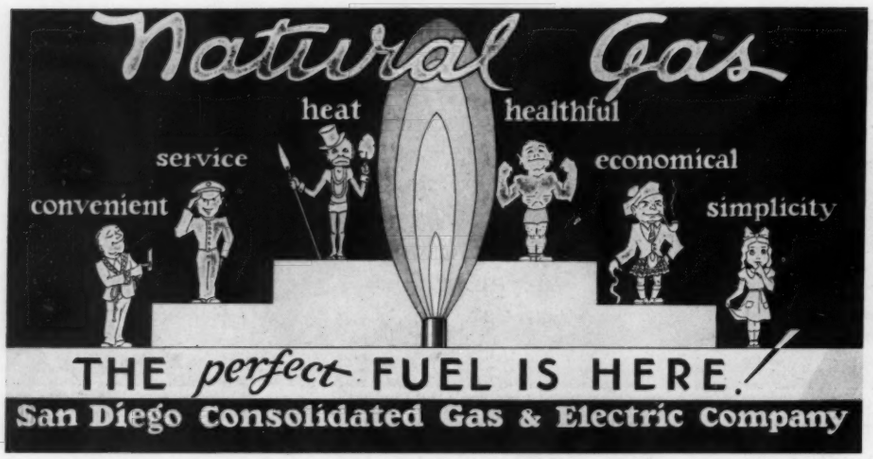
A series of weekly half-page newspaper advertisements were utilized, also beginning well in advance of the change-

ABOVE:

Two portable field headquarters moved from district to district.

AT LEFT:

A special tank-truck brought natural gas from distant fields for use during the change-over school and for test work on special installations; it is shown above at a commercial bakery.



over. Thirteen of these half-page advertisements and three monthly issues of "Natural Gas News" were issued before the first turn-ons, the third mailing of the company newspaper being coincident with the beginning of house-to-house appliance adjustment work.

Short radio announcements were employed, three to five times daily, at various stages of the turn-on work when timely information was desired. During the two-month period of appliance adjustment the company also made good use of poster boards for "reminder copy."

Public interest in the change-over in San Diego was at a high pitch throughout the course of the work, and the excellent cooperation of city newspapers contributed to this end. It was the company's belief that the newspapers, if they knew the facts of the change-over, would see "news" of first importance in it, and would also accept a share in the responsibility of putting the change-over through safely. Developments fully justified this view. Perhaps the best single evidence of newspaper cooperation is the fact that small front-page boxes were run in San Diego papers each day preceding the turn-on of natural gas into a new district, giving necessary details to the public.

Natural gas advertising has a humorous side in San Diego, as seen in the above examples. Characteristics of the new fuel were dramatized by the ensemble shown in the upper advertisement; individual cartoons of the family were used in a follow-up series.

The "copy" at the right was used at the halfway stage of the change-over.

Public Response Appreciated...

OVER half of our entire territory is now being supplied with Natural Gas. Thirty-three thousand customers have been visited by appliance adjusters. More than 100,000 appliances have been converted to the new fuel.

To date this colossal task has been accomplished without serious mishap. We are indeed grateful and wish to express our sincerest appreciation for the splendid co-operation accorded our adjusters everywhere.

Realizing the possible hazards associated with the "change-over," newspapers throughout the county volunteered their services in assisting our program of public education. The press deserves an inestimable amount of credit and thanks.

Expressions of satisfaction with the new fuel are numerous. We hope for universal approval. We earnestly bespeak your patience while becoming accustomed to Natural Gas.

WM. F. RABER, President

Natural Gas
THE PERFECT FUEL

SAN DIEGO CONSOLIDATED GAS & ELECTRIC COMPANY

SERVICE

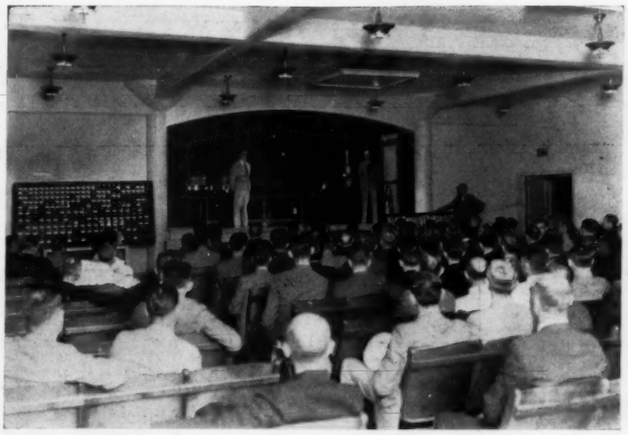
Getting the change-over story before the press was handled in this fashion: Several preliminary stories concerned with the beginning of the undertaking were prepared by the company and released to the papers. By this time the appliance adjusters' school was in full swing, and editors, editorial writers, together with a number of star reporters, were taken on a tour of inspection through this school, witnessing the instruction of 500 men in its several departments. The school itself will be described shortly; suffice it so say here that it was feature "news" for the press. City editors were first invited to tour the school; this often resulted in an assignment for a star reporter to cover the sessions; and it established the informational background which made it possible to bring in news stories to the city desk at all stages of the campaign. Editorial writers were next taken through the school, and the thought left with them that a public service was to be rendered the whole body of their readers by cooperating for a safe change-over.

A feature which drew a big share of news mention was the playlet produced before the change-over men. By example, rather than precept, this company-staged playlet put over the message that workmen were to confine themselves to company business—and to handle that with courtesy and efficiency—while on consumers' premises.

When the actual adjustment and turn-ons were begun the company's advertising did effective service. In advertising copy maps of change-over districts were shown, the day before each district operation, and instructions were again issued to consumers covering what to do during the transition period. At the half-way mark in the change-over another news release impressed general facts of the enterprise, and these were again repeated at the conclusion of the work.

Unusual change-overs made news throughout the operation, and the splendid cooperation given by consumers was acknowledged by the company whenever possible in news stories toward the end of the drive.

While the foregoing account covers the chief elements in this informational campaign, there were several novelties contributing to the same purpose. Ad-



Group of adjusters in auditorium. Note materials display board at left.

How NOT to do it—shown in playlet produced for change-over crew.

Range and water heater section of the change-over school laboratory.

Group of student adjusters in water heater section of laboratory.

A few scenes from the San Diego natural gas change-over school.

vertising copy, for example, was given a humorous slant in many cases through use of cartoons. Some of this copy is illustrated with the present article. Also among the interest-builders were several "smelling stations"—bottles containing small quantities of the odorant used in the natural gas—located at company and district headquarters. Consumers were encouraged to learn the "smell" of the new fuel.

All in all, the company feels that its publicity operations, contributing as they did to a safe change-over, and centering favorable attention upon gas service, were in themselves a substantial good-will campaign.

ORGANIZING THE CHANGE-OVER

The decision to introduce natural gas was reached by the San Diego company about the middle of March, 1932. Laboratory work to determine what changes would be necessary in adapting appliances and distribution system to the new fuel began in April.

Plans for appliance adjustment were laid with extreme care, the company recognizing that an adequate job would cement its customer relations even more closely than in the past, and that inadequate work would have an opposite effect.

A special survey of commercial and industrial users was run, yielding advance information on what materials and operations would be called for at each of these important points. As a guide for purchasing of materials and planning steps for the domestic appliance adjustment the company had reference to house-to-house inspection which had been conducted two years previous. Typical appliances, old and new, were brought into the laboratory for experimentation in the early stages of the planning.

A special change-over purchasing organization was set up in the purchasing department. Here the information was assembled on the hundreds of individual items needed—workers' tools, appliance parts, etc. More than a million appliance parts alone were purchased and used in the adjustment.

At the same time a staff was busy zoning the distribution system, installing valves and blank flanges in preparation for districting the company's mains into 24 zones. These ran from Oceanside, 40 miles north of San Diego, to the Mexican border, 20 miles south.

Another primary operation was the preparation of instruction materials which would be called for during the school and during the change-over. These included:

(Continued on Page 38)

. . . Automatic Control

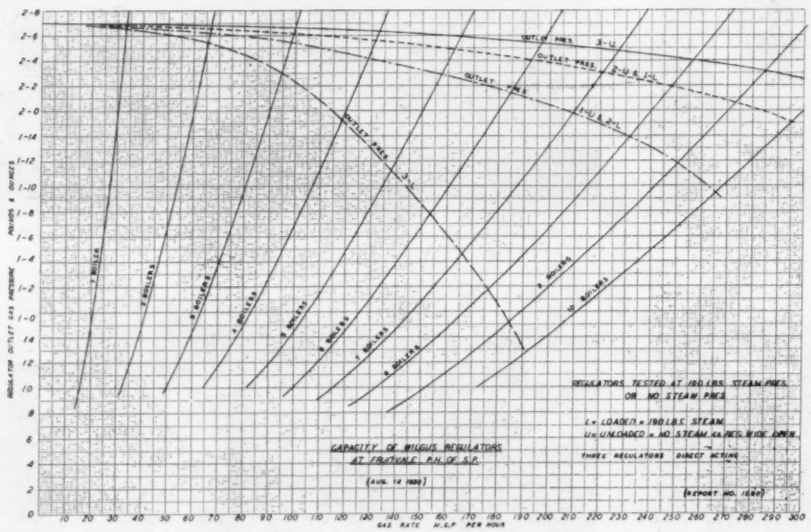

CAPACITY OF WILCUS REGULATORS
AT FRUITVALE P.H. OF S.P.
REGULATORS TESTED AT 180 LBS. STEAM PRES.
OR NO STEAM PRES.
L = LOADED = 180 LBS. STEAM
UL = UNLOADED = NO STEAM 44 REG. WIDE OPEN
THESE REGULATORS DIRECT ACTING
(REPORT NO. 1680)
GAS RATE M.C.F. PER HOUR

Fig. 1.

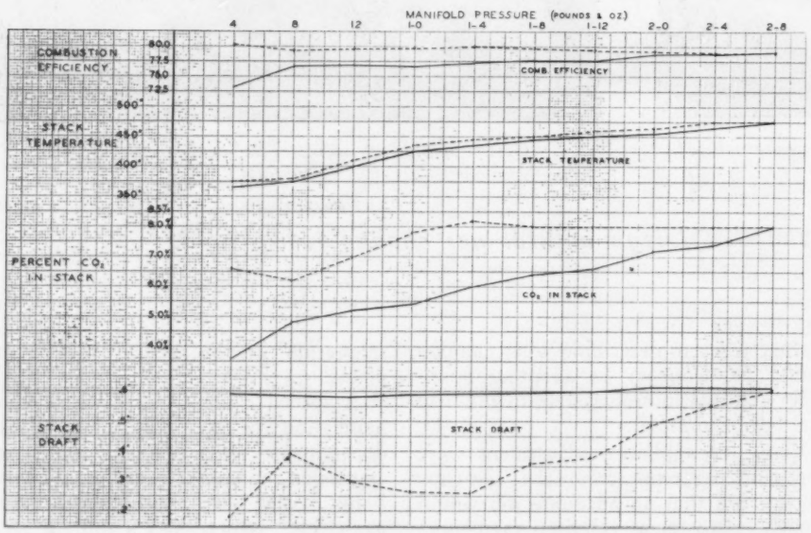


Fig. 2. Efficiency test on boiler at Fruitvale power house of Southern Pacific Co.

A SKILFUL, intelligent man, placed before a valve or other control mechanism, and provided with a recording instrument to give him momentary variations in temperature or other measurements, could control an operation with reasonable accuracy. He would have to be on the alert every moment, and naturally would be less efficient at certain times of the day than at others. A well designed mechanical "Robot" however can do the same work, at much less cost, and be equally efficient regardless of the hours of work. The work of this "Robot" is termed "Automatic Control."

The utility and economy of gas fuel is greatly enhanced by the application of automatic control. Although gas is easily controlled manually, and thousands of industrial applications utilize gas through hand control, the superiority of automatic control is bringing about its widespread adoption in the industrial and heating field. Today many of the largest individual applications of gas as well as most of the precise ones, use some form of automatic control. This is brought about for various reasons, among which are: Greater economy in the use of fuel; accurate control of steam pressures, heating temperatures or cycles; and elimination of tedious, and at times, haphazard hand manipulation of anywhere from one to dozens of valves.

To conduct a successful campaign for making natural gas conversions, every aid must be utilized to the greatest possible extent. Direct selling, advertising, feature articles, educational meetings, all these have a part in this campign. After interest is created, however, and installations go into service, the attention of the purchaser is focused on his choice of equipment, and its performance. His acceptance of natural gas will depend on the materialization of the statements and forecasts as to results made to him by the gas salesman, or the appliance dealer.

Processes to Which Controls Are Applicable:

The best example of the acceptance of automatic control is probably the gas range thermostat. Its advantages are known to hundreds of thousands of people. There are only a few other large classes of heating operation, these being water heating, air heating, and steam boilers of all sizes. Aside from these there are hundreds of various kinds of

J. F. AICHER'S discussion will be presented at the December 14-15 Organization Conference of the Pacific Coast Gas Association, at San Francisco, before a joint meeting of the Commercial and Technical Sections, as a contribution to the Industrial Sales Committee, Commercial Section.—*Editor.*

J. F. Aicher

It's Industrial Applications And Advantages

By J. F. AICHER

Industrial Gas Sales
Pacific Gas and Electric Company

processes, but only a relatively small number in each class. Some of these are:

Core ovens	Stereotype pots
Drying ovens	Tinning kettles
Bakery ovens	Metal melting pots
Lithographing ovens	Asphalt melting tanks
Sterlizing ovens	Annealing furnaces
Galvanizing kettles	Carburizing furnaces
Glass annealing lehrs	Steel treating furnaces

A wide variety of controls are now manufactured to perform innumerable tasks. A complete control, including the actuating mechanism and gas valve, may be in one piece, as for example a gas range thermostat. Usually the control is in two parts—the valve, which may be diaphram operated, motor operated, or solenoid operated; and the actuating mechanism, which may be adjacent to the valve or remote, and which may be operated electrically, by gas or liquid pressure, or by expansion of metallic or bimetallic elements.

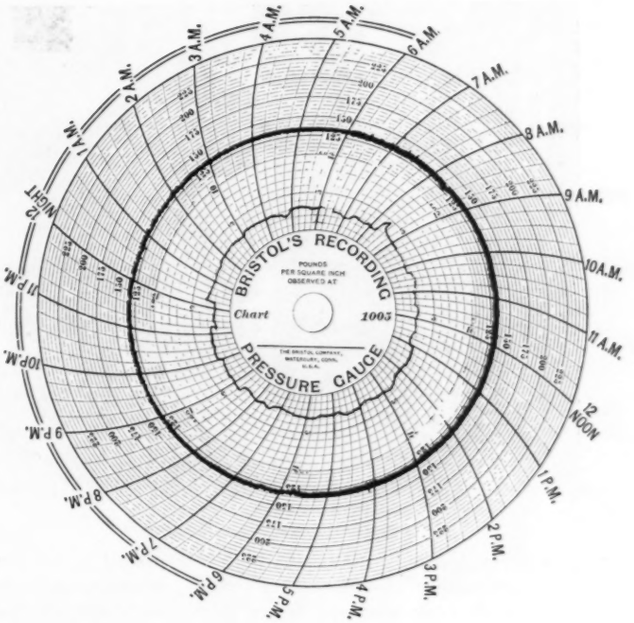


FIG. 3.

Superimposed gas pressure and steam pressure chart on boiler operation at Spreckles Sugar Co.'s plant, Salinas, Calif.—23 250-h.p. boilers and two 500-h.p. boilers.

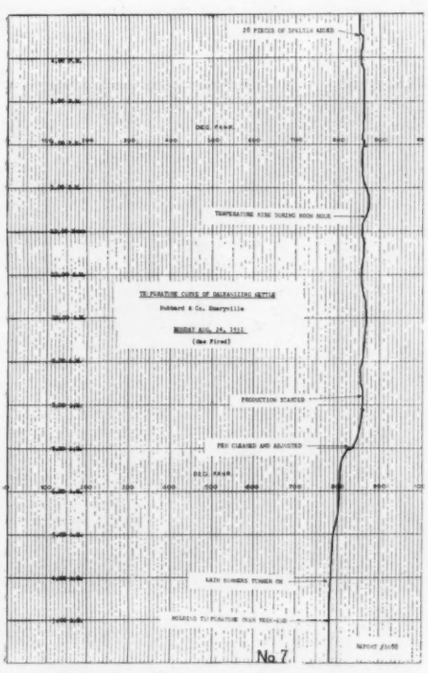


Fig. 4. Temperature curve of galvanizing kettle at Hubbard & Co. plant, Emeryville, Calif. (See also Fig. 5).

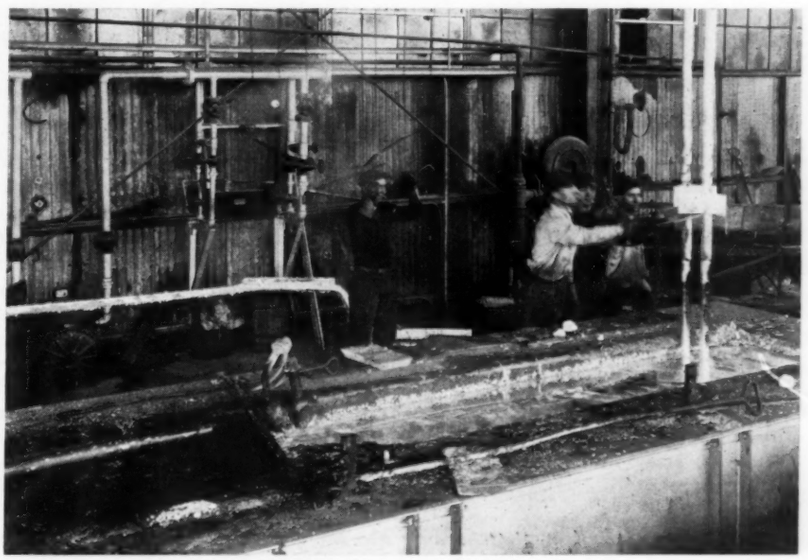


Fig. 5. Galvanizing kettle, Hubbard & Co. Emeryville plant. (See also Fig. 4).

General Performance of Controls:

Practically every task satisfactorily done by an installation of a piece of automatic control apparatus, may also be termed an "advantage." Expenditure for control equipment is made for the following reasons:

1. Saving in labor, or release of labor for more productive duties.
2. Greater uniformity of work, pressures, or temperatures.
3. Ability to reproduce certain cycles.
4. Fuel savings.
5. Minimizing number of rejections.
6. Longer life of refractories or containers.

The fact that controls are available for almost every conceivable need of the heating and industrial field, does not relieve the sales engineer of the responsibility of making a careful and judicious choice of both types of equipment and amount of equipment on any particular installation. Too much equipment on certain jobs causes service difficulties. Experience teaches that it is not always safe

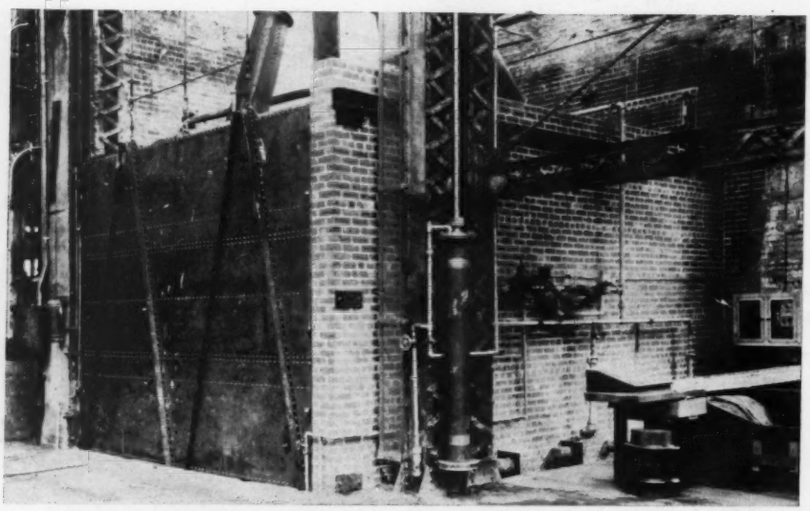


Fig. 6. Gas-fired core oven at Mare Island Navy Yard, equipped with automatic control, magnetic cutoff, and electric clock. Length of oven, 22 feet 7 inches, width 16 feet, height 11 feet 4 inches, maximum gas pressure 5 pounds.

to rely too explicitly in the functioning of certain applications. For instance, a perfectly reliable water-feeding device may lime up. Thus it is always the practice to include a "low water" safety device, in any installation of an automatic water feeder to a boiler.

The range of jobs which automatic control devices will handle may be briefly summarized as follows:

1. Control of combustion, both as to amount of air and fuel, and relative proportions, in boilers, furnaces, and other appliances.
2. Control of temperatures, in rooms, ovens, furnaces; also of water and other liquids.
3. Control of pressures in boilers, cookers, etc.
4. Control of flow of liquids and gases.

New and Unusual Developments:

One of thet latest developments is the anticipatory control, which operates on the principle of trend analysis. As soon as a temperature or other curve begins to reverse, corrective adjustments in fuel flow are made.

Another development is the "heat gradient" method of control, used particularly where there is a considerable difference in temperature between the combustion chamber and the work, as is the case in lead pans in the wire industry. To prevent "hunting" and too great overrunning and underrunning of the control temperature, caused by the lag in heat flow, two or more temperature responsive elements are placed in different parts of the gradient. For example, one element may be placed in the combustion chamber, where it responds quickly to the changes in supply of heat, and the other element may be placed in the receiver of heat. The work temperature is thus stabilized much more satisfactorily than is the case with ordinarly control.

In the field of boiler fuel controls, another company has developed what it calls the "precision pilot" gas fuel regulator. This combines the advantages of the spring and diaphram type of fuel regulator, and the pilot-operated type of regulator in which the valve is either all on or all off. Where loads fluctuate through a large range of the boiler's capacity, this type of control allows sufficient valve opening almost instantly in response to a small drop in steam pressure. (See operation chart, Fig 4, Spreckles Sugar Co.)

There have recently been several installations made of a device on boiler stacks called the "fuel saver." This device is cut into the stack and made an integral part of it. It has an adjustable counterweight on a swinging door, which hangs in such a way as to swing freely with changes in draft. No doubt the intention of this device is to relieve operators of damper manipulation. There are not enough data available on this type of control to arrive at definite conclusions as to its worth.

In the field of open hearth furnaces, control hook-ups have been devised which reverse the heating controls from the temperature difference on the two sides of the furnace. Also in this same application, constant furnace pressure is maintained through automatic damper control, and combustion is controlled through a CO_2 recorder-controller. This saves refractories, and conserves fuel.

Performance of Some "Automatic Control" Jobs:

It is estimated that 90 per cent of the gas consumed in industry is burned under boilers, and it is interesting to note that practically every application to boilers includes some automatic control equipment.

Basically, a boiler consists of a suitably enclosed firebox and steam generating apparatus, and a stack for venting products of combustion. During use, particularly at maximum load, the stack damper is usually wide open, and the firebox air intake devices are also open sufficiently to take in the proper amount of air for combustion. Any adequate automatic control device must be capable of controling the fuel and air in correct proportions for any demand, at maximum combustion efficiency. Also, when a hot boiler is shut down, usually it is imperative to close the dampers and other boiler opening to prevent cold air going through the boiler. The act of finally closing down a boiler is usually done manually, but during operation, as little hand manipulation of valves, dampers, etc., as possible, should be necessary.

(Continued on Page 41)

Fig. 7. Automatic control equipment on heat treating furnace controlling cycle for heat treating KA-2 metal. Fig. 8. Record of one hour's operation of gas-fired mattress sterilizing oven, Burns Mattress Co., San Jose Calif. Proper temperature, 230°.

Retail Selling Practices *on* Gas Refrigeration

As Analyzed in A. G. A. Committee Symposium

GAS refrigeration in the few years during which it has been available to the industry, has established itself firmly in the sales programs of many companies. Its advantages from the standpoint of load building, load holding, and public relations are each year strengthening its position in the sales department, with more companies becoming active in its promotion both through direct sales and dealer cooperative work.

Looking at gas refrigeration results over the past year or two of difficult selling, two facts stand out: Sales volume has held up more strongly than in any other gas appliance line; unit sales prices have been sustained.

Sales practices on gas refrigeration are not altogether standardized, due to the newness of the appliance and the differing conditions under which it is sold in various sections. However, every company may benefit from examining the methods which successful sales organizations are today using in their refrigeration promotion. Of timely interest in this connection is the 1932 report of the American Gas Association's Refrigeration Committee. The Retail Sales subcommittee of the Refrigeration Committee, under the direction of C. R. Logan, chairman, this year circulated a questionnaire on sales methods to 30 companies doing 85 per cent of the retail sales volume on gas refrigeration. Twenty companies replied, their answers yielding some interesting facts on current practices in retail sales work.

On the basis of this inquiry the committee offers the following pertinent observations on refrigeration sales programs:

1. Gas refrigeration sales will be successful in any sales endeavor where the proper executive help is actively demonstrated.

2. Gas refrigeration will not be successful in any sales endeavor where either the sales or service units are lacking in cooperation or confidence in the ability of themselves or their products.

3. Employee cooperation is one of the first sales problems and should be accomplished before any endeavor to sell the public.

4. Training of salesmen on a definite schedule appears to be lacking and must be considered before any successful selling job will be accomplished.

5. A systematic canvass must be planned and kept in full operation.

6. Gas refrigeration has the romance, the user confidence, and the possibility of proving to any gas utility of the utmost importance in public relations.

From the 20 answers to the committee's questionnaire, the following information is gleaned. (The outline below follows the form of the questionnaire.)

1. Number of active meters (domestic) served by your company.

Answers

1. Average number is 183,000—if the largcompany is taken from the list the average is 133,000.

2. Number of Salesmen: (a) Wholesale? (b) Retail? (c) Combination?

Answers

2. Out of the 20 companies reporting:
   12 have wholesale salesmen—averaging 3.6 men.
   8 have no wholesale salesmen—use combination men.
   Retail salesforces average 20 men.

3. Are these salesmen selling refrigeration exclusively? What other appliances do they sell?

Answers

3. Only 4 companies report that their retail salesmen sell refrigeration exclusively. (This is quite surprising, in view of the presumably accepted view that gas refrigeration is a special field—requiring special salesmen—special training, etc.) Of these 4 companies 2 are small and 2 are large, so that size has nothing to do, evidently, with policy on this matter.
   1 company reports salesmen sell refrigeration and house heating.
   14 companies report salesmen sell all domestic gas appliances.

4. Do you employ supervisors for refrigeration salesmen?
   (a) How many men to a supervisor?
   (b) How are supervisors compensated?

Answers

4. 14 companies employ supervisors, with an average of 7 salesmen per supervisor. Supervisors are practically all on a salary and commission basis.
   6 companies apparently do not employ supervisors, although these 6 companies average 12 salesmen each.

5. Are territories closed and assigned to an individual salesman? Is salesman fully protected ?

Answers

5. All companies reporting use a "Closed Territory Plan" of some sort, with salesmen assigned to a definite area, and fully protected on filed prospects.

6. Do you assign territories by: (a) meters? (b) income tax records? (c) geographical areas?

Answers

6. Territories are assigned by geographical areas in two-thirds of the cases reported and by meters or combination consideration of meters and geographical areas in one-third of the cases.

7. How are salesmen compensated?

Answers

7. 7 companies pay straight commission of from 10% to 15%.
   13 companies pay salary and commission. Of these 13 companies:
   3 companies pay around $50 per month plus 8% to 10% commission.
   5 companies pay around $75-$80 per month plus 4% to 8% commission.
   5 companies pay around $100 or more per month plus 5% or 6% commission.
   6 companies require a minimum sales production of $1,000 to $1,500.
   All companies pay same compensation winter and summer.
   Exactly half of the reporting companies report the use of some Bonus Plan (generally limited to special campaigns, but not always the case). Most of these bonuses run from $2 to $5 per box.

8. Do you provide regular schooling before allowing salesmen to contact prospects?

Answers

8. All but 3 companies (17 out of 20) provide salesman with a regular schooling before actual field work. In addition:
   3 companies hold regular "weekly inspirational schools."
   7 companies hold regular "monthly inspirational schools."
   Most of the reporting companies were very vague on their reports of any further schooling given salesmen other than the original hiring schooling. They con-

(Continued on Page 32)

ESSENTIAL INFORMATION THAT SHOULD BE PROVIDED FOR ON CUSTOMER'S REQUEST FOR SERVICE ON GAS APPLIANCES

1. No..... Date.....
2. Customer's Name, Address and Phone Number.
3. Call received by..... Time.....
4. Call reported by .....
5. Call referred to.....
6. Nature of request.....
7. Trouble found. Work done. How left.....
8. Work Started..... Time..... Date.....
   Work Completed..... Time..... Date.....
9. Serial No..... In guarantee Yes ( ) No ( )
10. Hours Labor.....
11. Material Used.....

What Should *be* Appliance

A portion of the Report Submitted by the A. G. A. Committee on Appliance Servicing.

GAS companies cannot operate successfully unless the various activities they carry on are analyzed and studied closely and the information obtained on the various kinds of work is used as a basis for establishing policies concerning such work. Appliance servicing is not an exception to this rule. It is therefore essential that data on service calls and service costs on various appliances be kept.

The committee presents herewith information that should be kept, together with a proposed standard method for obtaining and recording it so that the data will serve as a basis for comparing appliance service work of various gas companies as well as a basis for establishing or changing company policies regarding the selling and servicing of gas utilization equipment.

Performance Data on Appliances In Use; Cost Data on Appilance Servicing

The only way in which performance data on appliances and appliance servicing can be used to advantage is to provide the proper forms for recording and summarizing such information. The first of these forms is the so-called "Customer's Request Ticket," Work Ticket, Job Ticket, Complaint Ticket, etc., which is usually arranged to be a record of the customer's request and also serve to dispatch such information to various servicemen, and contain information on trouble found, work done, how left, etc.

On this page is an outline of the essential information that should be provided for on such a form. Most companies provide for most of the information shown on this form, but a good many do not provide for appliance information shown and material used.

The Serviceman's Field Report of Work Done is sometimes made out to include most of the above information and in such cases can be attached to the original customer' ticket and filed with it as a complete record of the job. The field report serves as a convenience in this respect and also provides the necessary information from which service studies can be made.

Form No. 1—Summary Form

In order that systematic studies of appliance service requirements can be made, Form No. 1 is recommended for use as a standard analysis sheet for service calls on gas appliances. It is recommended that gas companies keep such a record for appliance servicing so that in the future comparative studies can be made which will serve as valuable information regarding the operation and maintenance requirements of various types of gas appliances.

The classifications as shown are intended to be general, but at the same time involve enough details to point toward weaknesses in the service organization or the appliances. Service organization weaknesses will, therefore, come to the attention of those who can take steps to correct them, and appliance weaknesses can be brought to the attention of the manufacturers, and improvements recommended.

This form can also serve as an analysis sheet for any particular type of appliance

SUMMARY OF SERVICE CALLS ON GAS APPLIANCES

	Classification of Trouble Found or Adjustment Req'd	*Central House Heating*	*Water Heating*	*Refrigeration*	*Cooking*	*Space Heating*	*Miscellaneous*	*Total*
Gas System	Burners							
	Pilots: Plain							
	Automatic							
	Controls							
	Flues and Chimney							
	Supply: Piping							
	Leaks							
	Dist. System							
Electric System	Temperature Controls							
	Limiting Controls							
	Motor-Operated Controls and Valves							
	Supply: Customers' Side of Meter							
	Dist. System							
Water System	Radiation							
	Piping							
	Controls							
	Sections, Tanks, Etc.							
	Supply and Miscellaneous							
	Instructions on Operation and Use							
	High Bill							
	Miscellaneous: (Not Otherwise Classified)							
	TOTAL							
	Number of Units							
	Hours Labor							
	Material Cost							

MONTH OF 19 COMPILED BY DATE

Form No. 1.

Information Recorded *on* Servicing?

B. A. JOHNSON

Public Service Company of Northern Illinois
Chairman

and the subdivisions be used to show the various makes. For instance, the heading of the form could be "Summary of Service Calls on Water Heating Appliances" and the subdivisions classified as "Lovekin," "Pittsburgh," "Ruud," "American," etc.

The following explanation of the various headings is made to give a clearer understanding of this form:

Gas System: Anything on the appliance which uses gas or is gas-actuated.

Burners—Anything that pertains to adjustments required to get proper combustion of gas at the burner, the cause of which is in the burner, such as air adjustments, gas rate, orifice change, back-fire, etc.

Pilot—Anything that pertains to the adjustment required to get proper burning of gas on a plain pilot, and proper operation on an automatic pilot so as to insure proper functioning in case of failure in gas supply or extinguishment of the pilot.

Controls—Those controls which are a part of the gas system and gas-actuated, such as Snap Valve, RobertShaw, Oven Regulator, Gas Pressure Regulator, if it is a part of the appliance, etc.

Flue and Chimney—Flue or chimney troubles which cause improper operation of the appliance, such as condensation, down draft, too much draft, etc.

NOTE: If a flue condition makes it necessary to change the adjustment on the burner, the classification should be under "Flue Troubles" and not "Burner Troubles."

Supply—Any troubles with the gas supply, which are not strictly a part of the gas appliance, such as low pressure, leaks, stopped service, etc.

Electric System: Any part of the appliance which depends upon electricity for its operation.

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APPLIANCE MAINTENANCE RECORD

ADDRESS..... NAME.....

Kind of Appliance.....Make.....Type.....

Serial No.....Date Installed.....Guarantee Expires.....

SERVICE HISTORY

Date	*Service Man*	*Req. No.*	*Nature of Trouble and Work Done*

Form No. 2. (5-inch by 8-inch card.) The service history is continued on the reverse side of this card.

HOUSE HEATING INSTALLATION AND SERVICE RECORD

INSTALLATION RECORD

NEW HOME ☐ REPLACEMENT ☐ X CONNECT ☐ CONVERSION ☐ DATE INST'D.....

BOILER, BURNER, OR FURNACE
MAKE.....
TYPE.....
SIZE.....
SERIAL NO.....
RATING.....

CONTROLS
MAKE.....
ROOM THERMO.....
SAFETY.....
OTHER CONTROLS.....

SALES DATA
SALESMAN..... SALES TICKET NO.....
HEATING CONT'R.....
BURNER ORDER NO..... THERMO. ORDER NO.....
BOILER
RAD'N INST'D..... CONTR. ORDER NO.....
RAD'N REQ'D..... TYPE RAD'N.....

SIZE SERVICE..... SIZE METER..... METER NO..... SIZE FLUE PIPE..... CHIMNEY CLEANOUT YES☐ NO☐
INSTAL'N OK'D BY..... DATE..... REMARKS.....

SERVICE RECORD

DATE	REQ.	INSP.	CHECK	SERVICE MAN	TICKET NO.	AMT. CHARGED LABOR	AMT. CHARGED MAT'L.	NATURE OF TROUBLE, WORK DONE, REMARKS
12/12/32	*X*			*Jones*	*10631*	*No*	*ne*	*Snap valve leaking. Installed new seat.*
6/12/32		*X*		*Roy*	—	*No*	*ne*	*Major inspection.*
9/20/32	*X*			*Jones*	*10926*	—	—	*Lighted pilot and started for season.*
9/25/32			*X*	*Jones*	—	—	—	*Checked operation.—O. K.*

NAME..... ADDRESS..... TOWN.....

Form No. 3. Filed in visible record index book. Record at dispatcher's desk, providing record of previous calls given to servicemen at time calls are dispatched. The service record is continued on the reverse side of the card.

REFRIGERATOR INSTALLATION AND SERVICE RECORD

NAME..... Phone.....
ADDRESS..... Town.....
Date Inst'd..... Guarantee Expires..... Installed by.....
Model..... Color..... Sold by.....
Cabinet..... Unit.....
Remarks.....
.....

SERVICE RECORD

Date	*Req.*	*Insp.*	*Check*	*Service Man*	*Customer's Ticket No.*	*Nature of Trouble, Work Done, Remarks*

Form No. 4. (5-inch by 8-inch card file.) Service record is continued on the reverse side of the card.

Objectives *and* Funding *of the* Pension *and* Benefit Plan

Part II: Characteristics of the Funds

By ROBERT A. HORNBY

*Pacific Lighting Corporation**

AN EXAMPLE OF THE FUNDS NEEDED FOR A PLAN

Fund No. 1

The company's provision of the major portion of the retirement income (The Pension).

Fund No. 2

The provision of the cost of the death benefits.

Fund No. 3

The provision of the cost of the disability benefits.

Fund No. 4

The provision of a thrift or savings account for the employees' contributions, a part of which will be used to provide the minor portion of the retirement income, and the remainder of which will be returnable upon withdrawal or death.

Table No. 7

NOW I shall pass from the objectives to the funding, though I am not unmindful of the many intervening steps which must be taken by those who are attempting to evolve a sound and solvent plan. A plan will not be sound and solvent unless some understanding is had in advance of the characteristics of the funds, and particularly *what to avoid* when schedules are being designed. This understanding will bring conviction of the necessity for fully funding the benefits as they are earned. Thus, this industry may not be faced with the conundrum of deciding whether to break its promises to its employees, or to deny its stockholders future dividends.

The cases of the railroads are well known. One railroad paid out $250,000 in 1902, and $7,500,000 in 1931. Its pension bill is still increasing, but its revenues are declining. It never funded its plan.

Many such instances have occurred during the past few years, when the combined stress of the times, represented by declining revenues and increasing number of pensioners, have made this problem a major catastrophe. One of the most recent that has come to my attention is the case of a national industry which has lately told those who are now on pensions that, regardless of what they have been receiving, there is just sufficient monies to pay them $25 per month for the next 12 months after which not only will the pension plan come to an end but also the monthly payments to those who are now pensioners. This problem is insidious because when its crisis is evident so much back service has accumulated that it is impossible to fund it.

This pension matter has not been a major problem to Pacific Coast utilities because our growth, both in properties and number of employees, has occurred largely since 1918. I do not mean by this that we have sprung from zero to our present staff, but the increase and particularly the "turnover" has hidden and forestalled the true pension cost. Our population has increased tremendously and our industries have been growing at an unequaled rate. These industries have attracted our people as we have attracted some of theirs. This has caused a very high withdrawal (and turnover) rate resulting in a comparatively low average age and a fairly short past service. Thus far our accrued liability is small.

Our pensioners have been few in comparison with other industries. However, as we all know, this turnover and persistency condition has undergone a great change since 1929, and probably has been undergoing a gradual change since about 1926. In the older and larger industries, experience has shown us and actuarial forecasts have convinced me that there will surely come a day when a large percentage of our present staff will be near or past retirement age. The arrival of this period will be accelerated or retarded, depending upon the future growth of California, and the Pacific Coast States. Therefore, it is essential that we commence to give this pension matter serious attention and fully to fund the benefits of our plans, if these plans are to be solvent and all years are to carry their share of the costs.

One of the authorities on the subject says that it is far better to have the means with which to pay a 1 per cent rate of pension than to be promised a 2 per cent rate of pension and find that the means have not been provided. Since I must generalize, it can be stated that costs are in direct relation to the benefits, and that the payment of these benefits are in the long future. Therefore, part of the problem is properly forecasting these costs so that we know what our future costs may be and thus judge what can be afforded. As an illustration, I have compiled a list (Table No. 7) which shows the four funds involved in one complete pension and benefit undertaking.

Robert A. Hornby

These funds are natural divisions. Every employee must do one of three things: First, he must live to old age; second, he must die before retirement; third, he must be disabled, or in other words, must be overcome by economic death. You will find, therefore, that the funds are logical.

Employee's Contribution

Fund No. 4, the employee's contribution, is unique. It has social as well as financial reasons entering into its characteristics. The social point is that the employee will not, and cannot, dedicate his money to its ultimate purpose until his arrival at retirement age. He demands, therefore, that the funds be returnable to him if he dies—or if he

* This is the second and concluding installment in Mr. Hornby's discussion of pensions and supplementary benefits, presented originally before the Pacific Coast Gas Association's 1932 convention at Del Monte, Calif. Part I appeared in *Western Gas* for November, 1932.—*Editor.*

lives. It might also be desirable from purely social reasons, to guarantee that even after retirement he will have returned to him an amount at least equal to his contributions. Thus, from the company's viewpoint, the fund becomes an escrow or custodian account throughout an employee's term of service.

The existence of this fund serves the financial purpose of determining and limiting the amount or the excess which the company must have in its reserve (Fund No. 1) to provide whatever balance is necessary for the employee's retirement income.

With these remarks regarding Fund No. 4, which are obviously partial, we pass to the consideration of the characteristics of the three major funds. I shall try to be brief, but in doing so, must fail to give complete proof of some statements which I shall make.

Company's Provision for Pension

If we recognize the conditions which any competent actuary must take into consideration in making his cost forecast for contributions to Fund No. 1, we shall approach the development of a pension schedule with more intelligence, and with considerable more temerity.

In Table No. 8 I have attempted to list these conditions.

Items 2 and 3 require an inspection, not only of the company's past records, but a consideration of what the immediate future is likely to offer—whether it compares with the past;—if it does not, then the actuary must determine where he can obtain information as to the rate of withdrawal. This differs, not only by companies and periods, but by sexes. The females pass out of the industrial group in great numbers before the age of 30, fortunately, for the costs of the plan. Insurance carriers say that they live on forever if they are retired; apparently with nothing to worry them except as to whether the canary bird has seed and the cat has kittens.

Not only must the actuary determine how many will withdraw, but he must make a forecast as to the frequency and the age of the replacements. He must approach the matter of salary increases with the same frame of mind.

In this case, I have assumed that a rate of pension has been adopted which is expressed as a ratio of current earnings, rather than of any final earnings. If you wish to complicate the actuary's problem, you can do so by expressing your pension in terms of final salary or final periods of salary, or in terms of increases by years by salary classes, thereby offering him the impossible task of not only predicting what the average rate of salary increase shall be, but for whom it shall occur, and when. Your forecast will then become nothing more than a glorified guess, and will be correct by coincidence only. Much more time could be devoted in warning against the use of "the per cent of final salary basis".

The application of these variables, to be correct, must be made by one acquainted with actuarial principles and particularly with an appreciation of their limitations. The lack of knowledge of the proper use of these variables in determining future pension costs has contributed its share to the causes of insolvent plans.

It is also with respect to this particular Fund No. 1 that the use of a consultant, an actuary, is a necessary safeguard in the future for the interpretation of service history that has gone by, particularly when this service history takes the place of forecasts and narrows the gap between calculated and actual needed reserves.

Death Benefits

In dealing with Fund No. 2, the actuary has considerably more experience to draw from. For a long period in the past, the insurance business of this country has gathered reliable statistics as to the expected rate of mortality. The tables which they have developed have become one of the most exact which we have available for our use. This is reflected in their forecasted rates for group insurance. Therefore, any forecasts of cost which are made for such benefits are more likely to be borne out by actual experience provided that the group which we are considering has the numerical, occupational and geographical diversification inherent in the law of averages as reflected by mortality experience statistics. This, of course, can be guaranteed by associating the funding of this benefit with that of an insurance carrier dealing in group undertakings; thus enabling a smaller number of lives to enjoy the leveling influence of this association wherein there lies not only the numerical strength but the widely diversified risks of the large carriers doing a group business.

Disability Benefits

In Fund No. 3, the disability, we are usually dealing with a cost less than the pension cost; that is, if we pay benefits from it in accordance with the intention of the plan. However, the experience of the insurance carriers has been that this type of benefit has lent itself to petty fraud. The experience during the past three years has been so bad that carriers have commenced to discontinue writing this business.

In the case of Funds Nos. 1 and 2, we are dealing with two things which probably can be definitely ascertained with some feeling of security. In Fund No. 1, we can tell fairly closely when a man reaches retirement age. In Fund No. 2, it can usually be determined when a man is dead; but in Fund No. 3, he is not only alive physically, but mentally, in most cases. He therefore, has the time and has demonstrated the ingenuity to devise ways of obtaining benefits which were never intended to be paid. However, this need not deter you from meeting this question, and insurance carriers have agreed that the industry itself is in a much better position to control the application of such benefits if they will administer them.

In designing a disability benefit schedule, it is well to remember that we have little reliable experience, both on which to make a forecast of the number of cases and on which to make an estimate of their duration and their costs. From the many plans that were inspected, which included some provision, most often inadequate, it was evident that a forecast of costs must have been a very difficult undertaking. A clear recognition of the objective which you hope to attain will help you to simplify the structure.

If you pay benefits sufficient to relieve need, you will not find the cost burdensome. Fortunately, the average case of disability is from 40 to 50 days, but

(Continued on Page 42)

IN CASTING UP THE COSTS FOR ANNUAL CONTRIBUTIONS TO FUND NO. 1

The Actuary Must Determine:

1. The excess over employee's share (80% to 60%) of each anticipated annuity pension grant.
2. The survivors (1 out of 3) of death, disability and withdrawal.
3. The principal sum (an annuity) necessary ($115 to $125) to provide a life income of $1.00 per month.
4. The rate of interest (4½%) that may be earned.
5. The average rate (2% over previous year of salary increase.

Note: Any figures shown above must not be considered typical or average for the industry. They are illustrative only, being the results of one study of one group of employees.

Table No. 8

Pacific Coast Gas Association

Managing Director: Clifford Johnstone
Association Headquarters:
447 Sutter Street, San Francisco

President: H. L. Masser
Vice-President and Executive Engineer,
Los Angeles Gas and Electric Corp.

Home Appliance Exposition to Feature Organization Conference

THE Association's annual Organization Conference to be held at the Whitcomb Hotel in San Francisco, December 14 and 15, will include many important and interesting features. Not the least of these will be the Pacific Gas and Electric Co.'s Home Appliance Exposition held for the purpose of acquainting the public with the latest models of gas and electric household appliances, and incidently with the hope that Christmas buying in the Bay District will be directed toward the purchase of the warmth and comfort and the convenience which these appliances can furnish. The Exposition opens in the morning of December 13 and will close the evening of December 16.

Another innovation in mid-year Association meetings will be a Customer Relations Conference in which all members and their friends are asked to participate. Thoughtful business men know that business is gained and held more often than not by little things, a clerk's smile, a pleasant voice, an efficient manner, or a courteous explanation. These little things go to make up what we call "Service," a word which might more properly be spelled "Serve us." Every business man realizes the vital importance of the little things, but in large organizations such as public utility companies and department stores which may have many hundreds of employees, the secondary problem of education and supervision becomes more difficult of solution than the original conception. The purpose of the Customer Relations Conference is to discuss certain phases of the problem. We can promise an interesting and instructive afternoon.

Yet another feature of the Conference is a joint dinner meeting with the Gas Appliance Society of California. Trade relations and dealer cooperation have, like the weather, been discussed for years. This Gas Appliance Society dinner will be proof that something can be done about it. Utility men, manufacturers and dealers will all participate, and here again your attendance will be rewarded.

Otherwise the program speaks for itself.

WEDNESDAY, DECEMBER 14th
9:30 A. M.

Accounting Section
R. N. Dreiman, General Chairman
Parlor A—Whitcomb Hotel

Discussion of Merchandise Accounting, Fixed Capital Records, Customers' Deposits, Internal Audits and Office Short Cuts.

Assignment of Committees.

Public Relations Section
D. L. Scott, General Chairman
Parlor B—Whitcomb Hotel

To plan the scope of the Section's Activities for the year and to decide such matters as Educational Program, Contests, etc.

Organization of the Section.

Joint Meeting, Commercial and Technical Sections
Italian Room—Whitcomb Hotel
F. U. Naylor, General Chairman
Commercial Section
Guy Corfield, General Chairman
Technical Section

Symposium: Testing and Adjusting Commercial and Industrial Gas Installations. Led by M. A. Richford, Pacific Gas and Electric Co.

Paper: Controls for Industrial Installations, J. F. Aicher, Pacific Gas and Electric Co. (This paper appears in full in current issue of *Western Gas.)*

Discussion of paper, "Flues and Chimneys for Gas Burning Equipment," by Frank Wills, Pacific Gas and Electric Co. (This paper was printed in *Western Gas* August, and added to in October issue).

Paper: The Character of Gas Furnace Installations, W. M. Couzens, Supervisor Pacific Coast Branch, American Gas Association Laboratory.

Luncheon Commercial Section
12:15 P. M.

White and Gold Room — Whitcomb Hotel.

Organization of Committees and Discussion of Assignments.

Customers Relations Conference
D. L. Scott, Chairman
2:00 P. M.

Italian Room—Whitcomb Hotel

A joint meeting under the auspices of the Customer Relations Committees of the Pacific Coast Gas Association and the Pacific Coast Electrical Association.

Themes

"Credit and Collection Practices—in Receivership."
"Customer Misunderstandings."
"Application of the Company's Policy by Employees; How to Check Them?"
"Every Employee a Salesman."
"Appliance Adjustment Practices."
"Uniforming Contact Men."

It is hoped that gas and electric utility people in all branches of the service will find it possible to attend this Customer Relations Conference. While it is under the auspices of the Public Relations Section, the subject is broader than any Section and the value of the conference will depend upon the participation of representatives of all arms of the service.

Gas Industry Banquet and Rally
6:00 P. M.

$1.25 per plate

Larkin Hall—Civic Auditorium

Under the auspices of Gas Appliance Society of California and Pacific Coast Gas Association. Chairman—R. E. Fisher, Vice-President in Charge of Public Relations and Sales, Pacific Gas and Electric Co.

"The Industry's Plans for 1933."—Inspiration—Facts—Entertainment.

THURSDAY, DECEMBER 15th
9:30 A. M.

Italian Room—Whitcomb Hotel

Technical Section
Guy Corfield, General Chairman

Progress Report Production Committee —C. P. Johnson, Chairman, Puget Sound Power and Light Co.

Progress Report Distribution Committee—F. A. Hough, Chairman, Southern Counties Gas Co.

Progress Report Natural Gas Transmission Committee—B. M. Laulhere, Chairman, Southern California Gas Co.

Paper: Can We Improve the Domestic Gas Meter?—Lee Holtz, Southern California Gas Co.

Paper: Natural Gas Dispatching—R. T. Peterson, Pacific Gas and Electric Co.

2:00 P. M.
Technical Section (Continued)

"Distribution Design"—A presentation and discussion of report of last year's committee, led by N. L. Hoff, Los Angeles Gas and Electric Corp.

"Regulator Design"—A presentation and discussion of report of last year's committee, led by W. A. La Violette, Pacific Gas and Electric Co.; followed by demonstration of apparatus used by committee in conducting tests.

Meetings Held by Range and Furnace Manufacturers

On November 15, Pacific Coast gas range manufacturers met at the Jonathan Club, Los Angeles, with representatives of gas companies in the Los Angeles district. Andrew L. Kerr of San Francisco, chairman of the Range Division, Pacific Coast Gas Association, presided. The meeting was devoted to a discussion of ways and means to increase range sales and to perfect cooperation of manufacturers and utilities.

On November 16, a similar meeting was held by representatives of the Southern California Furnace Dealers Association and the utilities.

Proceedings

The Proceedings of the Pacific Coast Gas Association for 1932 is now in the hands of the printer. It will be Volume 23 of a series of uniformly bound books which record the aspirations, problems and progress of the Pacific Coast industry since the organization of the Association in 1893.

Only a sufficient number of copies are being printed to supply those members who have requested them.

Pacific Coast Statistics for Third Quarter

PACIFIC Coast gas industry statistics for the third quarter of 1932 were issued from Pacific Coast Gas Association headquarters in November. The statistics cover gas company operations for the months of July, August and September only. This quarter year is presented alone because the summer period is not greatly affected by temperature conditions and therefore reveals the normal trend more accurately than if the abnormally cold winter months of January and February, 1932 were included.

GAS COMPANY OPERATIONS FOR THE STATES OF CALIFORNIA, ARIZONA, NEVADA, OREGON AND WASHINGTON, AND THE PROVINCE OF BRITISH COLUMBIA

Third Quarter 1932 Compared with Similar Period in 1931

	Third Quarter 1931	1932	Per Cent Change
Production—M c.f.			
Water Gas	685,301	626,302	
Coal Gas	336,967	340,088	
Oil Gas	1,517,903	1,476,452	
Coke Oven Gas	159,331	158,619	
Butane Gas, 550 B.t.u.	32,892	38,348	
Natural Gas Purchased	36,698,186	27,623,621	
Total	39,430,580	30,263,430	—23.3%
Active Meters—Sept. 30			
Domestic	1,548,798	1,521,003	— 1.8%
Commercial and Industrial	65,755	67,074	+ 2.0%
Total	1,614,553	1,588,077	— 1.6%
Sales—M c.f.			
Domestic	9,512,566	10,208,295	+ 7.3%
Commercial and Industrial	24,822,250	15,266,894	—38.5%
Total	34,334,816	25,475,189	—25.8%
Gross Revenue			
Domestic	10,506,239	10,958,951	+ 4.3%
Commercial and Industrial	4,864,238	3,423,001	—29.7%
Total	15,370,477	14,381,952	— 6.4%
Miles of Main, Sept. 30	25,078	25,914	+ 3.3%
Number of Employees, Sept. 30	11,461	11,826	+ 3.2%

The figures reveal a reassuring increase in the California domestic business and but small recessions in other sections. Commercial and industrial business has, however, continued to drop sharply, particularly in California.

For the first quarter of 1932, California commercial and industrial sales were off 25 per cent but total sales showed an increase of 0.9 per cent because of an increase of 29.9 per cent in domestic sales due to abnormally cold weather in January and February, 1932. At the half year, domestic sales in 1932 were 23.6 per cent ahead of 1931 and commercial and industrial sales 28.1 per cent less, making total sales for the first 6 months of 1932 6.5 per cent less than in 1931. It should be pointed out that in 1931 large quantities of natural gas were consumed in steam-electric generating stations due to the unfavorable water conditions at hydro plants. This has not been necessary in 1932.

For the first 9 months of 1932 domestic sales are reported as 43,391,295 Mc.f. which is 20.2 per cent above 1931. Commercial and industrial sales are reported as 42,749,043 Mc.f., 32.4 per cent less than in 1931.

Total California sales in cubic feet for the 9 months period in 1932 are 13.2 per cent under 1931 sales.

Summarized figures for the third quarter appear below; detailed statistics, arranged by geographical sections, were included in the Association's release to company members.

1933 Cooperative Advertising Campaign

ANNOUNCEMENT is made by J. Charles Jordan, chairman of the Cooperative Advertising Committee, that approval has been secured for the continuance of the Association's cooperative industrial gas advertising campaign for 1933.

The program involves the use of display advertising space in practically all trade magazines having a primary circulation in west coast industries.

Copy will be designed to draw attention to the value of industrial gas and the service of the industry's gas engineers to the following groups:

Building Trades, Architects, Plumb-

ing and Heating, Steel and Metal Working, Bakers, Candy Makers, Laundries, Dairies, Factories, Cleaning and Dyeing, Furniture and Hardware Merchants, Hotels and Restaurants.

Supplementary to this display advertising campaign, the committee is arranging for the services of writers of feature articles who will provide technical and non-technical articles relating to the use of natural gas in the various industries. This material will be available for men in and out of the industry.

The committee appointed by President H. L. Masser to take charge of the Association's Cooperative Advertising during 1933 is made up of J. Charles Jordan, chairman, Pacific Gas and Electric Co., Douglas Buckler, Southern California Gas Co., J. Earl Jones, Seattle Gas Co., F. U. Naylor, Pacific Gas and Electric Co., E. P. Ramsay, Los Angeles Gas and Electric Co.

Water Heater Division, A. G. A., to Organize

A meeting of water heater manufacturers will be held in Cleveland, Ohio, about February 1 to complete the organization of the Water Heater Division, Manufacturers Section, American Gas Association. Frank W. Shuell is chairman and Paul Hamilton, vice-chairman. A tentative plan of action has been formulated which is now in the hands of manufacturers with a request for suggestions and criticism. R. C. Hoyt of Oakland is chairman of the Pacific Coast Gas Association's Water Heater Division, and W. J. Bailey of Monrovia, vice-chairman.

New Publications Received

Financial Policies of Public Utility Holding Companies, by Merwin H. Waterman, Assistant Director, Bureau of Business Research, University of Michigan.

Handbook of Butane-Propane Gases. Published by *Western Gas*. This is a comprehensive collection of technical and sales data on the preparation and utilization of butane and propane in their various forms.

Carbon Black in 1931, by G. R. Hopkins and H. Backus, U. S. Bureau of Mines.

Technical and Engineering Data for use in Connection with the Burning of Gaseous Fuels. An internal publication of the Pacific Gas and Electric Company prepared under the supervision of Frank Wills, Engineer of Production.

Farm and Village Housing Report to the President's Conference on Home Building and Home Ownership.

Manuals for Change-Over Fitters and Adjusters prepared by the Distribution Department, San Diego Consolidated Gas and Electric Co., for use of its change-over crew.

1932-1933 Calendar

December

12th Annual Meter Short Course and Conference — Ames, Iowa, Dec. 6-9, 1932.

Pacific Coast Gas Association—Organization Conference, San Francisco, Calif., Dec. 14-15, 1932.

January

National Bottled Gas Association—January, 1933.

March

Oklahoma Utilities' Association — 15th Annual Convention, Oklahoma City, March 7-8, 1933.

May

Southern Gas Association—25th Annual Convention, Washington, D. C., May 2,3,4, 1933.

September

American Gas Association—15th Annual Convention, Chicago, Ill., week of Sept. 25, 1933.

Thomas P. McCrea, Director of L. A. Gas and Electric Corp., Passes

THOMAS P. McCREA, a director, and formerly secretary of the Los Angeles Gas and Electric Corp., Los Angeles, Calif., died on November 25.

Thomas P. McCrea

He was born in Wilmington, Calif., November 15, 1871. Following the completion of his schooling he was employed with the Farmers and Merchants Bank for two years, leaving that place to become affiliated, in 1893, with the company which later became the Los Angeles Gas and Electric Corp., remaining with that company in active work until August, 1928, a period of 35 years. During his long service with the utility he was advanced from accountant, holding positions as auditor, purchasing agent, and assistant secretary, becoming secretary in May, 1916. In 1920 he became a member of the board of directors.

B. C. Electric Gets 30-Year Franchise at Saanich

Extension of the city gas mains at Victoria, B. C., into Saanich by the British Columbia Electric Power & Gas Co., Ltd., was approved recently, when the Saanich city council granted the company a 30-year franchise. Cost of the extensions will be approximately $20,000, the company having agreed to expend that amount in Saanich within two years.

The development will be a part of an expansion program estimated to cost between $80,000 and $100,000, which will embrace Esquimalt and Oak Bay as well as the settled areas of urban Saanich.

Pacific Gas and Electric Co. Turns Down Standard Deal

Pacific Gas and Electric Co., San Francisco, has definitely decided not to go forward with the acquisition of the properties of Pacific Public Service Co., subsidiary of Standard Oil Co. of California. This conclusion was based upon consideration of the recent decision of the California Railroad Commission, wherein the deal was authorized provided that Pacific Gas and Electric Co. allocated $5,000,000 out of its surplus account as part of the purchase price. The P. G. and E. company had made its purchase offer on the basis of an exchange of stock.

The railroad commission made a condition that the purchaser would not be allowed to issue securities against the $5,000,000 transfer from surplus until such time as earnings from Pacific Public Service would be large enough to pay dividends on the proposed issue of common stock, and until $5,000,000 of surplus had been created from earnings or sale of properties.

No announcement as to the disposal of the Standard-owned public utilities has been made.

Shafer to Manage for Northwest Cities at Astoria

C. A. SHAFER, manager of the Coos Bay Gas Co. at Marshfield, Ore., for several months, has been appointed manager of the Northwest Cities Gas Co. at Astoria, Ore. Mr. Shafer will be succeeded at Marshfield by N. Glen Talbot, who has been in charge of the Astoria office.

C. A. Shafer

Mr. Shafer has been with the Northwest Cities Gas Co. since January, 1931, becom- affiliated with the general office at Walla Walla, Wash., at that time. He is a graduate of the University of Oregon, college of business administration.

Both the Coos Bay Gas Co. and Northwest Cities Gas Co. are subsidiaries of Lone Star Gas Co., Dallas, Texas.

Fresno to Require Competency Examinations for Gas Installations

Upon agreement of both gas appliance dealers and master plumbers of Fresno, Calif., the city commission passed an ordinance in Fresno recently, requiring competency examinations for all persons installing gas appliances.

An examining board, consisting of a representative of the gas company, a master plumber, a journeyman plumber, an appliance dealer and an office engineer from the department of public works, will conduct the examinations.

Old-Time Barbecue Ushers in Natural Gas Service in Somerset

NATURAL gas service was begun by Peoples Gas Co. in Somerset, Ky., with the gas company entertaining 1,500 townspeople with "open house." A barbecue was held, with the food served prepared in an underground gas oven designed by H. W. Young of the gas company. More than 100 pounds of pork, 200 pounds of beef, 75 pounds of short ribs, several hams and several dozen chickens were prepared in the oven. The food that was left over was given to local charities.

Executives of the Petroleum Exploration Co., Sistersville, W. Va., parent company of Peoples Gas Co., attended the opening.

A demonstration of gas appliances was also a feature of the event.

The supply of natural for Somerset comes from holdings of Petroleum Exploration Co. in Clay County, Ky., and is being transported through the old Cumberland oil line which has been reconditioned for gas service. The line from Clay County to Somerset is about 60 miles long, of 4-, and 6-inch pipe.

In addition to supplying gas for distribution in Somerset, Petroleum Exploration furnishes a supply for Lexington, Richmond, Irvine, Ravenna, Corbin, Barbourville and Manchester, Ky. Kentucky headquarters are maintained at Lexington.

Oklahoma Utilities Assn. To Meet March 7-8 at Oklahoma City

The Fifteenth Annual Convention of the Oklahoma Utilities Association will be held March 7 and 8, 1933, at Hotel Biltmore, Oklahoma City, Okla. The two-day convention will be devoted strictly to business matters, all features purely entertaining in character being omitted. As in 1932 there will be a convention dinner. The general sessions will be held on March 7, followed by sessions of the Telephone Division and joint Gas and Electric and Electric Railway Division sessions.

The convention will not feature exhibits, but manufacturers wishing to arrange with the hotel for exhibit space during the two days will be privileged to do so.

Ruth Kleinmaier Appointed Home Service Chairman, Commercial Section

Walter C. Beckjord, chairman of the American Gas Association Commercial Section for the coming year, has announced that the chairman of the Home Service Committee will be Miss Ruth Kleinmaier, home service director of the Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y. The first meeting of the Home Service Committee will be held in New York, probably December 9, at which time will be planned the program of the year's work.

Southern California Gas Co. Reports 14 Per Cent Gain in Net Profits

Southern California Gas Co., Los Angeles, Calif., in November reported that net profits of the company for the 12 months ending October 31 were $2,883,454, after all charges, against $2,524,246 a year ago, an increase of $359,208, or more than 14 per cent. The net profits are equivalent to $15.84 a share on the 181,960 combined shares of both series of six per cent $25 par value preferred stock outstanding. All of the common stock is owned by Pacific Lighting Corp., San Francisco.

Appliances Sold by Gas Service Companies from January 1 to October 25

HOUSE HEATING	
Gas fired furnaces and boilers	357
Conversion burners	582
Large size space heaters	1030
Radiant type heaters	1528
Miscellaneous heating appliances	32
DOMESTIC	
Ranges	3272
Cookers	82
Water heaters—storage systems and tank heaters	1521
Laundry equipment—washers and ironers	714
Hot plates	122
Laundry stoves	86
Incinerators	56
Refrigerators	99
COMMERCIAL	
Commercial ranges	38
Bake ovens	10
Broilers	1
Toasters	1
Griddles	9
Urn burners	36
INDUSTRIAL	
Industrial boilers	5
Industrial burners	69
Industrial furnaces	4
Unit heaters	22

Gas Service Co. Sells 7,754 Gas Appliances From January 1 to October 25

NEW business departments of the Gas Service Co. of Kansas City, and affiliated distribution companies, under the direction of F. M. Rosenkrans, new business manager, in November completed the fourth of their major gas appliance sales campaigns of the year 1932, and opened a new drive for added conversion burner load.

Between January 1 and October 25 of this year a total of 7,754 appliances of various types were sold, as shown in the accompanying table, gross sales amounting to $600,538. Of the four major campaigns, the selling of large space heaters was the most successful. A quota of 550 had been set for the two-month period of the campaign. When the smoke had cleared away, a total of 782 heaters had been sold, or 142.1 per cent of the quota. The best record was made by Harold Diggle at the Union Public Service Co., Merriam, Kan., with a total of 26 large space heaters, or 433.3 per cent of his quota sold.

The Arkansas Valley Gas Co., Arkansas City, Kan., managed by J. G. Dawson, won second place, with a total of 40 space heaters sold, or 250 per cent of the quota.

The best record in the larger properties was made by the Wyandotte County Gas Co., Kansas City, Kan., with 114 heaters sold, or 247.8 per cent of the quota. This department, under Jack Torbert, new business manager, has made an unusual record during the entire year, always being near the head of the list in percentage of quota sold.

The Beloit Division finished in fourth place, selling 73 heaters, or 243.3 per cent of the quota.

Western Distributing Co., El Dorado, occupied fifth place, with 25 heaters sold, or 208.3 per cent of the quota.

Reports from the various properties engaged in the current campaign indicate that the same high standards of employee cooperation evident in the other four campaigns is still at work, with quotas holding up.

The burners are being sold for $80, and a special payment plan has been arranged. The initial payment is $5, with a monthly payment of $1.50 during the winter season and $5.50 during the summer season. The price includes thermostatic control.

Reorganization of Republic Gas Corp. Is to Get Under Way

Plans for reorganization of the Republic Gas Corp. have been announced in Chicago, headquarters for the company, which owns all the capital stock of the Argus Production Co., Saxet Gas Co., Saxet Oil Co., Moody-Seagraves Producing Co., and 93¾ per cent of the Missouri Valley Gas Co. Properties of these companies are located in Kansas and Texas and supply some of the larger lines with natural gas.

Reorganization plans provide for issuance of $7,791,500 new 6 per cent collateral trust bonds and 1,000,000 shares of $5 par value common stock of a new company which will take over the assets of the present organization. James R. Buck of Chicago is chairman of the committee which will have charge of the reorganization.

Lone Star Rate Decision Pending

THE first concerted attempt by the Texas Railroad Commission to regulate gas rates through fixing of a city gate rate was halted November 17 when a hearing to determine fairness of gate rates charged by Lone Star Gas Co. in 235 towns in Texas was recessed to be reconvened shortly after January 1.

Testimony of E. A. Steinberger, valuation engineer for the Lone Star System, was one of the high points of the hearing, when he set the total fair value of the Lone Star's public service producing and transmission properties in Texas and Oklahoma at $70,156,465 as of January 1, 1932, date of his valuation report.

The Fort Worth engineering firm of Hawley, Freese & Nichols which surveyed and appraised the same properties for the commission, set their value at only $41,391,666.

It would cost $73,927,635 to reconstruct the Lone Star System new, Mr. Steinberger testified. He found that the properties are in 93.7 per cent new condition. The total reproduction new figures include both physical and non-physical properties. Physical properties could be replaced new for $60,228,623, he testified, and the worth of non-physical properties is $13,699,012.

His testimony was upheld by that of Harrison Smith, a partner in the firm of Sanderson & Porter, New York, who made an independent valuation and financial setup of the Lone Star system. Mr. Smith stated that it would cost $65,617,065 to reproduce the physical properties under the theory of a general contractor doing the work. This figure does not include a working capital allowance, going concern value or a number of other items. The Lone Star engineer's figure was based on the theory that construction work would be done by the Lone Star's own engineering and construction forces.

D. A. Hulcy, chief auditor for the Lone Star System, was one of the chief witnesses for the company, his testimony centering on the net income of the utility. During his testimony Mr. Hulcy stated that taxes are the largest single item of uncontrollable expense to the company and that they are trending upward.

The gas rates under examination are 40 cents per 1,000 cubic feet for domestic gas and 12 cents a 1,000 cubic feet as the basic rate for industrial gas.

Bureau of Mines Activities Reviewed

SCOTT TURNER, director of the United States Bureau of Mines, issued his annual report to the Secretary of Commerce in November, containing several progress items of interest to the gas industry.

Study of the reduction of zinc by natural gas has been continued, and the chemical phases of the process are now thought to be completely understood. The operations of a continuous process, with laboratory-scale equipment, has been demonstrated to representatives of the zinc industry, and it is hoped that commercial application may be made in the future.

Knowledge regarding a common fundamental relationship between several oil and gas production problems, previously studied individually by the bureau, has been unified. Data from these problems helped the producing companies solve problems which involve spacing of wells, calculation of underground reserves, rates of water encroachment, and efficient and economical withdrawal of oil and gas from underground structures.

During the fiscal year, the bureau produced at the Amarillo, Texas, helium plant 15,171,680 cubic feet of helium of 98.11 per cent average purity. The Amarillo plant can produce 24,000,000 cubic feet of helium per year, but has never been operated at full capacity. The bureau negotiated purchases of gas rights in 50,000 acres on the Cliffside structure near Amarillo, and now operates this gas field.

Reduction of net costs from $36.18 per thousand cubic feet of contained helium produced in 1925 to $7.10 in 1932 has done much to make the Army and Navy lighter-than-air navigation program economically feasible. Moreover, use of helium instead of explosive hydrogen as a lifting agent has added tremendously to safety in this field of aeronautics.

Conservation Law of Texas to Be Revised

THE Conservation Act of Texas, applying to gas and oil, has again been under the eye of the Texas judiciary.

The act as originally passed contains the following provision relating to Commission orders against waste: " . . . provided, however, this shall not be construed to mean economic waste, and the (Texas Railroad) Commission shall not have power to attempt, by order or otherwise, directly or indirectly, to limit the production of oil to equal the existing market demand." It was contended in a test case, Peoples Petroleum Producers, Inc., *vs.* Smith, *et al.*, in the District Court of Eastern Texas, decided by a three-judge court, that orders of the Commission relating to the East Texas Field limited production in that field "in entire disregard of the differences as to each well, in productive capacity, situation in the structure . . . ," etc., and that these orders given by the Commission were not intended to be conservation orders to prevent physical waste of natural resources, but economic orders to keep the supply within the compass of the existing demand." The finding of the Court was that the Commission's orders "have no real relation to the prevention of physical waste, but on the contrary tend to cause it."

Following this pointed decision, Governor Sterling issued a call to convene the State Legislature on November 3 to consider supplementary conservation legislation. A bill was sent to the Governor on November 12 which, among other provisions, would broaden the powers of the railroad commission to consider reasonable market demand and other factors in conserving oil and gas. The bill is limited in duration to September 1, 1933.

A. G. A. Natural Gas Dept. Disposes of Magazine

On November 26 announcement was made from American Gas Association headquarters that the ownership of Natural Gas magazine will pass from the Natural Gas Department of the Association to H. J. Hoover, Cincinnati, Ohio, effective on December 31, 1932.

The A.G.A. statement read in part as follows:

"Natural Gas was established for the Natural Gas Association of America in 1920 by the directors of the Association and Mr. Hoover, then president of the Association, as they recognized the need of such a publication to properly represent the natural gas industry.

"During the existence of the Natural Gas Association of America and following its amalgamation with the American Gas Association when it became the Natural Gas Department of the Association, the magazine has been under the general supervision of Mr. Hoover.

"The Managing Committee of the Natural Gas Department, believing the best interests of the Association and the industry would be served by having the magazine owned and controlled by forces from without the Association, but desiring to continue its future in the hands of natural gas men, decided to accept an offer from Mr. Hoover for the purchase of the magazine."

Kansas City Gas Co. Engineers Talk at Janitors' School

Engineers of the news business department of the Kansas City Gas Co., Kansas City, Mo., talked to over 100 janitors attending the Janitors' School on November 8. The class meets weekly, with instruction in the art of being good janitors being given free by the Urban League of Kansas City. The three heating engineers from the gas company were Harold McGrath, Frank Pexton and Ray Houser, working under M. B. Buckley, new business manager for the company.

Mr. McGrath told the class about the construction, operation and maintenance of water heaters; Mr. Pexton talked on the combustion of gas, and Mr. Houser explained gas meters and gas ranges.

East Ohio Gas Co. Wins Point in Litigated Rate Case

On the motion of the East Ohio Gas Co. the Public Utilities Commission of Ohio has dismissed the application of the City of Cleveland for emergency rates, pending the Commission's hearing of the company's appeal from a rate ordinance passed by the city last year, and has held that under the statutes of Ohio, where rates were brought in question in proceedings before the Commission, the statutes had given the Commission no authority to institute emergency rates.

San Joaquin Light and Power Conducts Class in Gas Fitting

San Joaquin Light and Power Corp., Fresno, Calif., is conducting a class for instruction in gas appliance fitting and adjusting for employees of the company and of gas appliance dealers of the city. About 80 men are enrolled in the class, which will continue for several weeks.

Montana-Dakota Power Co. Sponsors "Fill the Sock" Range Campaign

Montana-Dakota Power Co. and affiliated organizations in North Dakota and Montana will have their final merchandising effort of 1932—the "Fill the Sock Campaign" for gas ranges—in full swing on December 3. This campaign will close on Christmas Eve, and if previous specialized campaigns put on by the company during the past year are any criterion, salesmen will eat their Christmas dinner secure in the knowledge that their quota for 1932 has been met.

An interesting prospectus was prepared by the company's new business department under A. E. Schwarz, commercial manager. The brochure effectively presented the sales plan in a Christmas motif of red and green. Each salesman is given a quota of ranges to "fill his sock," with sales talk for the various models of gas ranges presented attractively.

New Source of Gas Supply for Pacific Gas and Electric Co.

Pacific Gas and Electric Co., San Francisco, is completing accessory pipe lines to a score or more of completed wells in the Buttonwillow district for emergency use in its transmission line to San Francisco and other cities in the north.

Milham Exploration Co., on November 18 completed its Southern Pacific well on section 1 at Buttonwillow from a depth of 2,500 feet for a daily output of 14,000,000 cubic feet of natural gas, which will be available for P. G. and E.'s use.

Hearings Scheduled for December On Rates of Two California Utilities

A hearing on the investigation into the rates applicable to natural gas service charged by Pacific Gas and Electric Co., San Francisco, has been set for December 30 at San Francisco by the California Railroad Commission.

A similar hearing regarding rates charged for natural gas service by San Joaquin Light and Power Corp., affiliated with P. G. and E., will be held on December 13 at Fresno.

Gas Service Begun at Toppenish, Granger, and Zillah, Wash.

Several hundred people assembled at the outskirts of Toppenish, Wash., to witness the turning on of natural gas there, following completion of a new line to Toppenish, Granger and Zillah, Wash., by the Northwest Natural Gas Co. President R. B. Newbern of the company was present, as were also Edwin Hurst, superintendent, James Mann, construction foreman, and Chief Waneto Bill of the Yakima Indians. George Beardsley of Prosser, attorney for the company, acted as master of ceremonies.

Natural Gas Pipe Line Co. of America Relaying River Crossing

Construction of a coffer dam and flume to facilitate the relaying of natural gas pipe lines of the Natural Gas Pipe Line Co. of America under the South Chiquaqua River, seven miles northeast of Oskaloosa, Iowa, is being completed by Smith Brothers Construction Co., Kansas City. The work will cost in the neighborhood of $10,000. The line is being relayed to prevent washouts.

Sidelights on Status of Oklahoma's Utility Merchandising Law

OKLAHOMA Natural Gas Corp.'s recently inaugurated practice of installing conversion house heating burners free of charge, and in some cases transferring ownership of the burners after a stated amount of gas has been consumed, has brought an enlightening statement from the office of the Attorney General, State of Oklahoma.

Protest against the above practice was recently made to the County Attorney of the County of Oklahoma. He in turn called upon the Attorney General for an opinion as to whether the Oklahoma Natural's action violated the 1931 statute which supposedly prohibited merchandising by utilities.

The opinion returned from the Attorney General's office was to the effect that even if actual sales were being made by the company they would not constitute sale of merchandise "not directly connected with the general business" of the company "as authorized by its charter." The opinion also expressed extreme doubt whether sales had been consummated under the Oklahoma Natural plan.

Because of the light which it throws upon the legal status of the anti-utility merchandising statute in Oklahoma, the opinion from the Attorney General's office is quoted in part below:

"Section 2, chapter 46, Session Laws 1931, provides as follows, to-wit:

" 'It shall be unlawful for any public service corporation in this state, directly or indirectly, to engage in the sale of merchandise, utensils or chattels of any sort *not directly connected with the general business of such public service corporation* as authorized by its charter, except as hereinbefore provided. Nothing herein shall be construed to prohibit any public service corporation from selling fuse plugs, electric light bulbs, outlet plugs, sockets, extension cords, or other repairs or equipment necessary to maintain continuity of service to any patron or patrons of such corporation.'

" . . . The material part of said section, declaring certain acts to be unlawful, is as follows:

" 'It shall be unlawful for any public service corporation in this state, directly or indirectly, to engage in the sale of merchandise, utensils, or chattels of any sort not directly connected with the general business of such public service corporation *as authorized by its charter* . . . '

"The above language, in effect, provides that it is not unlawful for public service corporations to sell 'merchandise, utensils, or chattels' which are 'directly connected with the general business of the corporation as authorized by its charter.' This indicates that the Legislature believed that the exercise of said existing charter powers of said corporations, could or should not be declared unlawful. Said section, therefore, did not make it unlawful for a public service corporation to sell in Oklahoma, merchandise, etc., directly connected with its general business, if said sales were authorized by its charter. The subsequent portion of said section, in our opinion, in effect, provides that it will not be unlawful for a public service corporation to sell the things enumerated therein, even though the sale thereof is not directly connected with its business or authorized by the articles of incorporation on which its charter or license to do business in Oklahoma, was granted.

"By an examination of the articles of incorporation of the Oklahoma Natural Gas Corporation, which were in existence at the time Chapter 46, supra, went into effect, and on which its present charter or license to do business in Oklahoma was granted, it will be found that said articles then, and now, authorized said corporation among other things not pertinent here, to not only distribute and sell gas but

" 'To carry on *in connection* with any and all of said purposes the business of buying and selling goods, wares and merchandise.'

"By the use of the words 'in connection' in the foregoing quotation, it was evidently intended to limit the sales therein authorized, to merchandise, etc., directly connected with a general business of the Oklahoma Natural Gas Corporation. Hence the sales therein authorized are not sales which would conflict with the provisions of Section 2, supra. It should also be noted that in Volume 6 of the 1931 edition of Fletcher on Corporations, at pages 203-4-5, it is stated:

" 'A corporation has no power, as a general rule, to make contracts or engage in transactions which are foreign to the objects for which it was created, merely because such contracts or transactions will be beneficial to it. . . . If the benefits to accrue to the corporation are indirect, merely incidental and to come by reaction rather than as an immediate result, such a transaction is ordinarily not within the power of the corporation. . . . 'What is and what is not too remote must be determined according to the facts of each case.' *However, the tendency of the more recent decisions is to hold an act within corporate powers, if possible, where it is clearly beneficial to the company, as where the act directly tends to increase the business of the company.* Moreover, any attempt to apply the distinction between immediate and remote benefits must depend on whether the court, *in the circumstances of the particular case,* deems the act reasonably necessary to further the interests of the corporation. . . .'

"Inasmuch as . . . the gas burners . . . are to be furnished by said corporation to be used in furnaces now using coal or wood, in order to induce the owners thereof to use gas distributed and sold by said corporation and which use will directly tend to increase the business thereof, we are of the opinion that conceding said furnaces are actually being sold by said corporation, such sales would not be the sale of merchandise 'not directly connected with the general business' of said corporation 'as authorized by its charter.' Furthermore, it is extremely doubtful if under the facts set forth in your letter, a sale of the burners has actually been consummated."

Clarke Deane at Sioux Falls

Clark Deane has been appointed commercial manager of the Sioux Falls Gas Co., Sioux Falls, S. D. Mr. Deane goes to Sioux Falls from Owensboro, Ky., where he acted in a similar capacity with the Owensboro Gas Co.

MEASUREMENT and CONTROL

Accuracy of Orifice Meter Chart Computations

By C. D. McMartin
*Southern California Gas Company**

	DISTRICT NO	1	2	3	4	5	6	7	TOTAL
	ESTIMATED NO. OF CHARTS PER MONTH	60	200	130	300	300	450	2000	
		ERRORS IN CHART COMPUTATION							
OPERATION	READING	0	1	2	2	0	0	0	5
	ADDING	4	8	2	1	1	7	1	24
	MULTIPLYING	0	0	0	1	0	2	1	4
	COEFFICIENT	0	0	0	2	0	0	1	3
	EXTENSION	0	0	1	0	1	1	2	5
	TRANSFER TO LEDGER	0	0	0	0	0	0	1	1

CHARTS are the daily records of the operations of orifice meters. From these the volumes of gas that pass the meters are computed. It is necesary that this work should be done with extreme accuracy as the volume of gas received or delivered directly affects the income or expenditure.

There are several factors remote from the chart that have a bearing on the accuracy. One of these is the size of the disc in use, the diameter of which should always be plainly written on the chart. Another is the coefficient which is computed from the diameter of orifice and other known conditions.

C. D. McMartin

The coefficients are usually computed from time to time as the specific gravity or temperature of the gas changes.

The first operation after the charts have arrived at the office is to check them over very carefully for any defects, such as checking low at zero, static not marking, differential not marking, right time put on or taken off. The disc size and date are then entered in a book opposite the customer's name. When a chart comes in, it is checked with the disc size for the previous day. In this way should a mistake be made in the disc size, it will be found.

When discs are changed, a record showing this should be made out and sent to the office where the charts are computed.

The actual computation of the chart begins by entering the reading of the differential pressure and static pressure on a sheet usually called "The Orifice Meter Report." This is the actual reading of the chart. The reading periods of a chart are usually the average for each hour, but where charts are very regular and extreme accuracy is not required, the average for the entire day is sometimes taken. When charts are very irregular, it is necessary to use 15-minute periods. However, the hourly period is the generally accepted plan.

About one-half of these charts are checked, the others are spot-checked. When the hourly differential pressure and static pressure readings are all entered on the orifice meter report, then the next step is to apply the extensions. Following this, the extensions are added and the result multiplied by the hourly coefficient. The result of this gives the volume of gas in cubic feet. Then the daily volume of gas is entered in a ledger and there it remains to be used for billing purposes.

When a large number of charts are figured in an office, it is advisable to compute them in groups of several at a time. The method used for reading and checking charts is as follows: One chart reader will first read all of the charts in his group. Then he will extend them and later on add the extensions. Each operation is done with the group and not as single charts. These are then passed on to another reader who checks the addition and writes in the coefficient. He then multiplies the coefficient by the sum of the extensions and writes down the result, which is the volume of gas for the day. By this method the addition is checked before any multiplying is done. The coefficient and multiplication are then checked by a third clerk. The next operation is to check the size of disc used for the coefficient against the size of disc shown on the chart. It is also checked for parts of hours. After this, it is pinned to the chart and passed to the ledger clerk so that the volume shown may be entered in the ledger. In the above procedure, these charts may pass back and forth between two employees or may pass from one to another. In all cases, each employee places his initials near the operation for which he is responsible.

In an effort to determine the number of errors and also to ascertain if possible the operation which causes the most trouble, we have studied the conditions existing in a company where the charts are computed as a measurement procedure and are later subject to being checked by an auditor. This auditor may check all of the charts or any given number. The extent of his checking is usually determined by the number of errors found, but this is not always the case and sometimes a large number of charts may be checked even though the percentage of error encountered is very small.

In order to visualize in detail the extent of the errors made in each of the above mentioned operations, we have taken an audit of the charts from seven districts and have compiled a table (see Table No. 1) showing the number of errors found in each district while performing each of the necessary operations. We have also given an estimate of the number of charts checked. This shows that out of a total of 42 errors, 24 were caused from addition after the addition had been checked.

The extent of errors in the addition of the extensions is so conspicuous that we have found it advisable to make a recheck on all additions. A recheck of multiplications is made also. It is doubtful if sufficient errors are found to warrant the recheck in multiplications, but while the addition is being checked the amount of work required to check the multiplication is so small as to be practically negligible.

* Presented before the Southern California Meter Association, Whittier, Calif., September 22, 1932.

Exhibitors' Night Big Success for S. C. M. A.

EXHIBITORS night, held on December 1 by the Southern California Meter Association, was one of the most successful equipment displays which the Association has ever brought together.

The exhibit was held for the first time at the Gas Works Cafeteria Building of the Los Angeles Gas and Electric Corp., Center and Aliso Sts., Los Angeles, facilities being made available there to the Association through the courtesy of T. N. Kellett, superintendent of gas manufacture for the L. A. and E.

Nineteen firms exhibited their latest measurement and control lines, some equipment receiving its first showing to S. C. M. A. members at this meeting. Among the newer equipment was an orifice flow meter, an absolute pressure recording gauge, orifice fitting, pressure controller, humidifier, differential control valve, recording gas and liquid gravitometers, and a number of orifice meter "gadgets" including a mercury lock, Reid vapor pressure bomb tool joint, sample bomb plugs, and other items. Many other standard lines were also shown.

M. J. Cereghino, chairman of the Association's program committee, was in charge of arrangements for exhibitors night, assisted by President L. P. W. Des Brisay, George Stewart, W. J. Kennedy, and A. J. Norman, all of the Los Angeles Gas and Electric Corp. A buffet dinner was served to nearly 100.

The exhibit was open from four o'clock in the afternoon until 10:00 P. M., and was viewed by approximately 130.

Firms conducting displays at the meeting included the following:

American Recording Chart Co.
Braun Corp.

Bristol Co.
Byron Jackson Co.
Geo. S. Binckley Laboratories.
J. A. Campbell Co.
Commercial Iron Works.
Elliott Core Drilling Co.
Foxboro Co.
W. R. Ladewig.
B. F. McDonald Co.
Mid-West Pipe and Supply Co.
Merco-Nordstrom Valve Co.
Natural Gas Equipment Co.
Pacific Meter Works.
Reliance Manufacturing Co.
Southwestern Welding and Manufacturing Co.
Sprague Meter Co.
Swinco
Warren and Baily Co.

During the evening a drawing was held, with a slide rule donated by Fisher Governor Co. as prize, the funds from the drawing going into the Association's treasury.

S. C. M. A. Sports.

F. S. Burt of the General Petroleum Corp. was the successful contender in the golf tournament for October, the *Western Gas*-S. C. M. A. Goodfellowship Trophy remaining in his possession until the next play-off.

Association tennis got off to an excellent start on November 13, when a round-robin tournament was played on the courts of the Chanslor-Canfield Midway Oil Co., at Torrence, Calif. Fourteen players were on hand, the winning team being J. M. Harris and Walter J. Kelley, who won 30 out of 50 games played. B. G. Williams of the Southern California Gas Co., is chairman of the Association's tennis committee. F. E. Bradley of the C. C. M. O. Co. was host to the tennis group at Torrance.

A New Profession: Instrument Engineering

By J. B. McMahon

Chief Sales Engineer
*The Foxboro Company**

A NEW profession is rapidly gaining recognition as a branch of the great general field of engineering, demanding as highly specialized knowledge as any of the other divisions of engineering—electrical, mechanical, metallurgical, chemical, and so on. I imagine that in the course of time this new profession will come to be known as "Instrument Engineering." Already at least one university, namely the University of Pennsylvania, has started a definite course in this new field.

As time goes on, this new profession will come to be recognized more and more as being a distinctly different branch of engineering. Even now, anyone engaged actively in the practice of it need make no apologies for its being comparatively new. Indeed, it should be a source of pride rather than of apology, since those engaged in it are pioneers breaking the way and mapping the trails for those who will come after. On this account also, the profession at the present time is one of the most fascinating branches of all engineering, since it is always far more interesting to be one of the first to discover and apply new facts and laws than it is to be one of those who have to use them after they have been reduced to pure routine.

From the standpoint of the instrument manufacturer, the ramifications of "instrument engineering" are almost endless. There is scarcely a product with which one comes in contact in the course of his everyday existence which has not been influenced very strongly at some time during its production by some form of instrument. It is an interesting fact to note that the most efficient and largest operators in practically any field of commodity production are almost invariably the largest users of instruments.

A new profession such as instrument engineering could not spring into existence without there being a very distinct need for it. In the great process industries which have developed so rapidly during the past 30 years, it was early found that without very distinct indications and records of the variables affecting the quality of the product, control of these variables was practically impossible. The first instruments to be produced, therefore, were of the indicating and later of the recording type. Within comparatively recent times, automatic controllers have been developed which not only are able to indicate and record the variables, but also to control them.

From the standpoint of management, there are two separate aims for instruments: first, for operating purposes; and second, for accounting purposes. From the standpoint of operation, the proper and thorough application of indicating and recording instruments makes it possible to assure the management's having instantly at hand information which will make it possible to duplicate any given set of conditions whenever desirable. The records will give the information as to what the conditions of operation were, and properly applied automatic control will make it possible to reproduce them at any given time. Needless to say, from the standpoint of trouble-shooting during the day's operations, really accurate trouble-shooting can be done only if the process is properly equipped with the sufficient number of and right kind of instruments.

Proper instrument application is essential to economical and efficient operation. In certain industries it is possible to produce very uniform results without using a great number of instruments, but almost invariably, this is done at the sacrifice of efficient operation. Efficient operation invariably means that balance between initial investment, cost of raw material, fuel expense and labor expense, which will produce the maximum output at the minimum unit cost. It is possible to attain the best balance only through the proper use of instruments. Needless to say, this applies even more strongly to periods when operations must be conducted efficiently, as is the case at present, than it is during times when even extremely inefficient opcration may mean profits due to abnormally high prices for finished products.

*Presented before the Southern California Meter Association, October 27, 1932.

It is universally conceded by accountants that hit-or-miss methods of allocating income and expense result in inefficient operation. In a refinery, for instance, a cracking unit should be charged with all fuel consumed by it whether as fuel oil or gas, charged with all steam, and should be credited with the gas and fuel oil produced—this entirely aside from its operation as a cracking unit. Only if such charges are properly made, is it possible to determine whether or not such a plant is an economical investment which should be continued in operation "as is" or be replaced by a more efficient unit. It is frequently the case that even if two units costing approximately the same will produce approximately the same amount in quality of product and will use approximately the same amount of labor, one of them will prove a very much more worth while investment than the other due to its better fuel economy. It is absolutely impossible to know this, however, without the installation of the proper measuring equipment. Another intangible item which does not show up directly but is nevertheless universally recognized as being a valuable factor in plant operation, is that the proper use of measuring instruments gives operators very definite marks to shoot at. A great deal of thought and time is expended continually by executives in providing their workmen with definite performance incentives. Among the most difficult of the problems in this respect is the settling up of performance standards. Measuring equipment makes the providing of incentive standards very much easier than where an attempt is made to arrive at these standards purely by guesswork.

It is a practical impossibility to operate modern highly efficient, highly complicated process units without the application of the proper control instruments. For instance, no one would attempt to operate a modern gasoline stabilizing unit purely on hand control. From the standpoint of the danger involved alone, the impracticability of hand control is obvious.

Therefore, we might say that from four standpoints—namely those of operation, accounting, economy and safety—modern indicating, recording and controlling instruments are essential to present day industrial processes.

From a brief consideration of the foregoing, it is easy to understand why specialists in the specification, application and operation of instruments are necessary. To be an *ideal* instrument engineer, it would be necessary for a man to spend at least 10 years as a consulting engineer in any one of 40 or 50 different industries, for knowledge of the applications is just as necessary as knowledge of the instruments themselves. It is obviously impossible to properly specify instruments unless the details of the applications are thoroughly understood. In addition, their installation and operation require highly skilled supervision if the maximum value is to be obtained from them. It would seem, therefore, that the impossible is demanded of a competent instrument engineer, since he is expected to be at the same time a real expert on both the instruments and on their applications. In actual practice, this case is not quite so difficult as it seems. A good working knowledge of general engineering practice and a thorough knowledge of the laws of thermo-dynamics and general physics will give an engineer the basic equipment from which he can develop into an entirely competent instrument engineer. After all, the actual laws of physics and thermo-dynamics remain the same for various industries and it is only the variations of them in actual practice which have to be accounted for. In general, the problem involved here is one of

learning to speak the language of the particular industry involved. We have been surprised time after time to find that when we comprehended the special terms used in various industries to designate what are after all general laws, we have found that there was nothing at all basically different between the viewpoints of the operating men in those industries and our own viewpoint based upon our experience in other industries. There is one other special phase which often causes difficulty for an inexperienced instrument engineer. That is learning to differentiate between what is said to be the problem and what is actually the problem. This is particularly true in the application of controlling equipment. For instance, we very frequently have presented to us the desirability of controlling the temperature at some particular point in a process. Now it very often happens that under conditions of hand control when everything else in the process is smoothed out, the temperature at the point which is indicated as the point of control will become constant. This does not at all mean, however, that that point can be used as a location for the sensitive element of the thermal system of the temperature controller. Quite often, in fact, that result can be more desirably and better secured by the application of flow, pressure, or level controllers.

Another thing that makes desirable the use of men who are specializing entirely in such work for the specification and application of instruments, is that they are trained and experienced in the necessity of attention to detail. There is probably no profession in the world which demands a more constant and exacting attention to detail than the instrument business. The variations that exist in the installation of gas measurement equipment alone are well known. And yet, compared to general industrial installations of instruments, those used in connection with measuring the flow of gas, whether they be flow, pressure, temperature or humidity recorders, are comparatively well standardized. A very large proportion of the total number of instruments sold consists of instruments made to order for the particular job involved. I might digress a little here to say that this introduces a problem to the makers of instruments of far greater proportionate complexity than is encountered by almost any other business. It is impossible to stock more than a comparatively small proportion of the total number of instruments sold as standard assemblies, and the work of stocking subassemblies can proceed only to a comparatively minor degree. Unit quantities also, even on those instruments which are standardized, are much smaller than are customarily regarded as economical lot quantities in ordinary manufacturing. It is, however, a keen appreciation of the variations in application conditions which makes necessary this endless complication of details and specifications. Really satisfactory specifications of instruments both from the standpoints of operation and cost, can be accomplished only by men who have made a very definite and thorough study of the possibility of the almost numberless possible combinations of instruments.

In general also it may be stated that trained instrument engineers will accomplish their work much more economically than will be possible by anyone else, since, on account of the necessity of close attention to and appreciation of detail, preliminary work of layout will be accomplished much more quickly, installations will be made as rapidly as possible, and satisfactory operation will be secured much more quickly. The greatest source of loss in this respect is faulty operation of the equipment to which the instruments are applied, due either to their incorrect specifications or faulty operation. Incorrectly operating instruments can easily cause processes either to operate far below their potential capacity or produce material of incorrect specifications which has to be reprocessed at the same cost as the original processing.

An example of the difference between the way a trained instrument engineer and one who has not had the necessity of keen observation of differences in detail impressed upon him works, might be interesting.

As to the future of this new profession, I believe it is quite safe to say that it is going to occupy an increasingly important place in modern industry. As processes and industrial operations become more and more complicated, which they are doing every day, more and more instruments which are perpetually on guard and not subject to the defections of human beings become increasingly necessary. As we learn more and more concerning the possibilities of instrument application, we see more and increasingly interesting developments coming up in the future. We all can recall progress that has been made in the field of gas measurement engineering within the last 10 or 15 years and can appreciate that it is far closer to being an exact science today than it was 10 years ago. It is the writer's personal conviction that it is not yet an exact science but is an art, an intricate, fascinating branch of engineering which has, to my way of thinking, been defined very adequately as "the application of the achievements of art and science to the uses of mankind."

Gas Refrigeration Sales Practices

(Continued from Page 19)

tent themselves by merely mentioning "Manufacturers representatives meetings," "Sales talks from time to time," etc.

9. Do you follow definite plan for canvassing?

Answers

9. 14 companies report definite plans on canvassing.
6 companies report no definite plan on canvassing.
Of the 14 companies reporting definite plans on convassing:
None provide for less than 10 forward contacts per day.
Average provide for 20 new forward calls per day.
A few provide for 25 to 30 forward calls per day.
10 companies allow their salesmen to follow out their own forward call plans when they provide for the minimum number set by each company.
3 companies insist the salesmen follow company plan.
2 companies allow salesmen to follow their own plan in making the minimum number of forward calls, if the salesmen's plan has been approved.

Among the special ideas or plans mentioned as being used by various companies in canvassing work are:

1. "Salesman must know the name of the householder."
2. "Salesman must compare records of his calls with those of the other salesmen . . . he knows all the other salesmen's forward call records . . . comparisons are made."
3. "Salesman himself must mail a certain number of letters every third day, and follow them up by personal call."
4. "Salesmen must follow up the company's pre-approach letter." (Three companies stress this point.)
5. "Office tickler file keeps records of results of forward calls made, and reminds salesmen of call back dates." (Five companies stress this procedure.)

10. Floor Duty.

Answers

10. Floor Duty:
10 companies have special refrigerator salesmen on sales floors.
10 companies do not maintain special men on floors.
Of the 10 who have special men on sales floors:
5 pay them straight salary.
5 pay them salary and commissions (not stated).
All territory salesmen are protected by filing.
3 companies "split" the commission with floor salesmen—a 50-50 basis "split."
16 companies do not split the territory salesmen's commissions with the floor man; they regard the floor salesman as part of the regular overhead selling cost.

11. Do you maintain plumber cooperation plan?

Answers

11. Plumber Plan.
17 reporting companies have plumber plan.
3 reporting companies have no plumber plan.
Of the 17: 6 report good results, 3 report fair results, 6 report poor results, 2 just starting plan.

6 good results: "Close Cooperation" and several "Joint Campaigns" are emphasized, also "One-Half Commission" to the salesman.

20% appears to be the minimum discount to plumbers.

20% plus 10% appears to be the average discount.

"All merchandising profit" is the rare maximum.

From a source other than the questionnaire it seems:

(a) A flat water rate of $2.50 per year is charged for gas refrigerator connection in practically all cities which do not have water meters.
(b) An individual permit does not seem to be required for each refrigerator connection, with very few minor exceptions (business houses, etc.).
(c) All cities (available reports limited in number) require connection to be made by registered plumber or steam fitter.

12. Are your sales floors open evenings?

Answers

12. 2 companies report open evenings, very much satisfied with results secured.
4 companies report open evenings during special campaigns or for special appointments, and of these:
3 like the plan and results.
1 does not like it; not sufficient results.

14 companies report not open any other than regular business hours.
Of these 14:
8 are content with the situation, claiming that past trials have proved that being open in the evenings does not result in business commensurate with the costs.
6 would like to be open evenings, but 3 of these explain that such procedure is not in line with local practice, as recommended by local Chambers of Commerce or Better Business Bureaus.

13. Do you make allowances for old boxes:

(a) Offer premiums? (b) Give Sales Inducements?

Answers

13. Of the 20 companies reporting:
5 companies make allowances.
2 companies make allowances only on special occasions (perhaps once a year, etc.).
13 companies make no allowances.
None offer premiums.
15 companies offer no sales inducements at any time.
3 companies sometimes offer special sales inducements for a limited period for special occasions or campaigns.
2 companies do offer sales inducements of some sort (one offers a commission, the other a discount for cash).

14. Sales Promotion:

Answers

14. 5 companies report special sales promomotion man.
15 companies do not employ a special man for sales promotion work.
Salary and commission to those who do special sales promotion.
7 companies use all factory sales helps.
4 companies use most of the factory sales helps.
9 companies use some of the factory sales helps.
15 companies use direct mail regularly.
4 companies use direct mail at times.
1 company does not use direct mail.
10 companies do not advertise on company bills.
2 companies do not advertise on company bills except once a year.
8 companies do advertise on company bills.
16 companies use stuffers along with company bills.
4 companies do not use stuffers; their bills are delivered.
Leads from Users:
12 companies say "many" leads from users.
3 companies say "fair" leads from users.
4 companies say "few" leads from users.
1 company says "no" leads from users.
How Developed:
All companies emphasize calls by salesmen.
None mention using direct mail to users.
1 pays a commission and 1 gives small premium.

15. Employee cooperation; How developed?

Answers

15. 7 companies mention using meetings to develop employee cooperation.
1 company mentions letters.
3 companies mention teams and through department heads.
1 company mentions contests.
Bonuses for leads varies from $2 to $5, and averages $4.
All companies pay bonuses for employee leads.
% of employees having gas refrigeration varies astonishingly. It runs as low at 2%, as high as 75%, averages 25%.
16 companies say employees active in securing leads.
4 companies say "not very active, could be improved."
Special inducements for employees to purchase:
7 companies sell at cost (including installation cost etc.).
7 companies sell at cost plus 10%.

16. Servicing Data:

Answers

16. 7 companies give a two-year guarantee.
6 companies give an indefinite guarantee.
1 company gives a one-year guarantee.
2 companies give a five-year guarantee.
2 companies give a three-year guarantee.
13 companies do not guarantee service within 2 hours of request.
3 companies do not guarantee it, but give it.
4 companies guarantee it.
Service cost per box per year averages $4.
Service calls per box per year range from 1 to 4—Average 2.7.
Greatest Service Complaint:
8 companies state burner cleaning and adjustment.
7 companies state water trouble (control or consumption).

17. Did you display gas refrigerators at special exhibits?

Answers

17. 17 companies displayed gas refrigerators at special exhibits.
3 companies made no such displays.
12 companies state results merited the expenditures.
3 companies state "hard to check."
1 company stated it did not pay.
Special exhibits mentioned in order of numbers mentioned:
1. Special cooking schools.
2. Household exhibits and "home beautiful" shows.
3. Various forms of "food shows."
4. Refrigeration shows.
5. Trade exhibitions.
6. Guilds, church fairs, clubs, bazaars, etc.

18. What are your regular selling terms?

Answers

18. Greatest Time:
36 months 1 company
30 months 1 company.
24 months 14 companies
18 months 1 company
Finance Charges:
11 companies 6% interest.
3 companies 7½% interest.
1 company 5½% interest.
1 company 3% interest.
1 company 4% interest.
Wholesale:
5 companies sell at 20% discount.
5 companies sell at 30% discount.
3 companies sell at cost plus 10%.
1 company sells at cost.

19. What methods of advertising are used?

Answers

19. Radio—Only 2 companies use it.
Newspaper—Twice-a-week—half of the reporting companies. Once-a-week—half of the reporting companies.
Small advertisements, frequently, are greatly preferred to large advertisements, infrequently.
Original copy is used by all reporting companies.
Factory tie-in is made by about one-half of the companies.
Billboards—Used regularly by only 3 companies. Used occasionally by only 3 companies. Not used by 14 companies.

20. Information secured through new meter applications used as leads for refrigerator sales.

Answers

20. 15 companies say "Yes."
5 companies say "No."

21. What percentage of sales is replacing electric refrigerators?

Answers

21. 4 companies say "None."
5 companies say "Very small percentage."
2 companies say "Some."
2 companies say "2%."
1 company says "4%."
1 company says "5%."
2 companies say "10%."
3 companies say "No record."

22. Ratio of 1931 sales to active meters.

Answers

22. 5 companies do not state.
15 companies more at less than ½ of 1% than between ½% and 1%.
Only 2 companies state in excess of 1%.

23. Are your service men active in securing more sales?

Answers

13 companies say "yes."
4 companies say "some."
3 companies say "no."

24. How has low price of electric refrigerators affected your sales volume?

Answers

24. "Has hurt slightly" say 10 companies.
"Has hurt considerably" say 3 companies.
"Has had no effect" say 4 companies.
No answer—3 companies.

25. Suggestions you feel have helped you and would help the rest of us secure more gas refrigeration load.

Answers

"Constant, steady customer contact by salesmen."
"Firm company policy, firm credit policy. firm handling of sales organization to secure maximum coverage possible."
"Pay more attention to specialty salesmen."
"Use the users more."
"Make use of testimonial letters from users."
"Educate salesmen thoroughly, have sales plans well worked out as to details, have strict supervision to have them lived up to."
"Push small apartments' sales cultivate the financial source on new buildings, work for plumber cooperation."
"More calls, less details for the salesmen, best of service, increased local and national advertising."
"Work for better employee cooperation."

BUTANE - PROPANE NEWS

Covering Liquefied Petroleum Gas Service

Appliance Utilization

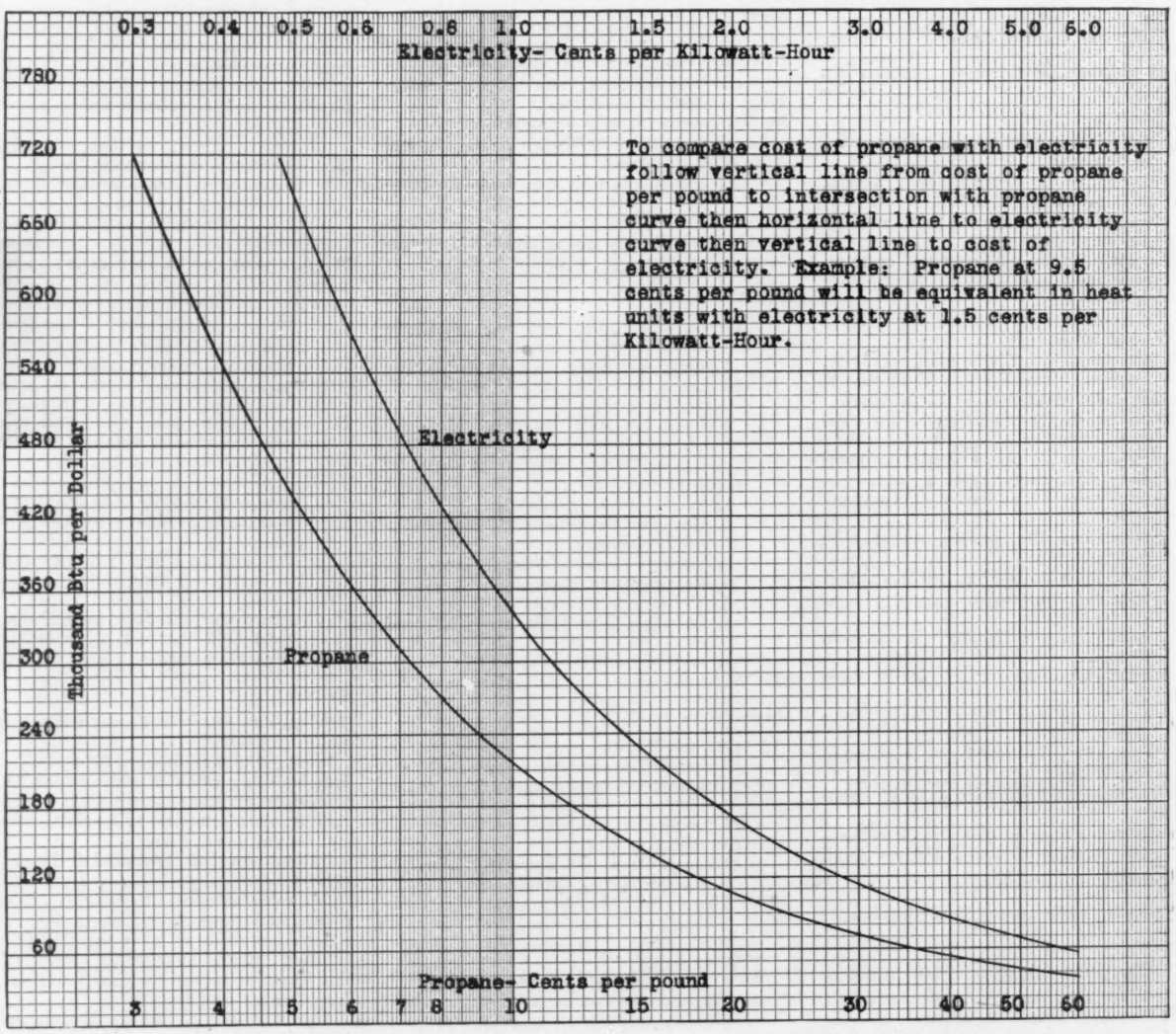
THE HANDBOOK OF *Butane-Propane Gases,* which came from the press in its first edition last month, devotes one major section of its contents to a subject on which limited information has hitherto been available—appliance utilization of liquefied petroleum gases. Walter M. Beery, consulting engineer, in this chapter deals with such phases as burner orifice capacities, capacity of service pipe and house piping, general requirements for burners of all domestic appliances. Under this last head is given detailed discussion of requirements for the efficient use of these gases in ranges, space heaters, water heaters, lighting fixtures.

To charts taken from Mr. Berry's chapter are reproduced in these pages. One is a combustion chart for commercial butane. A companion chart is included in the original chapter presenting similar data for propane.

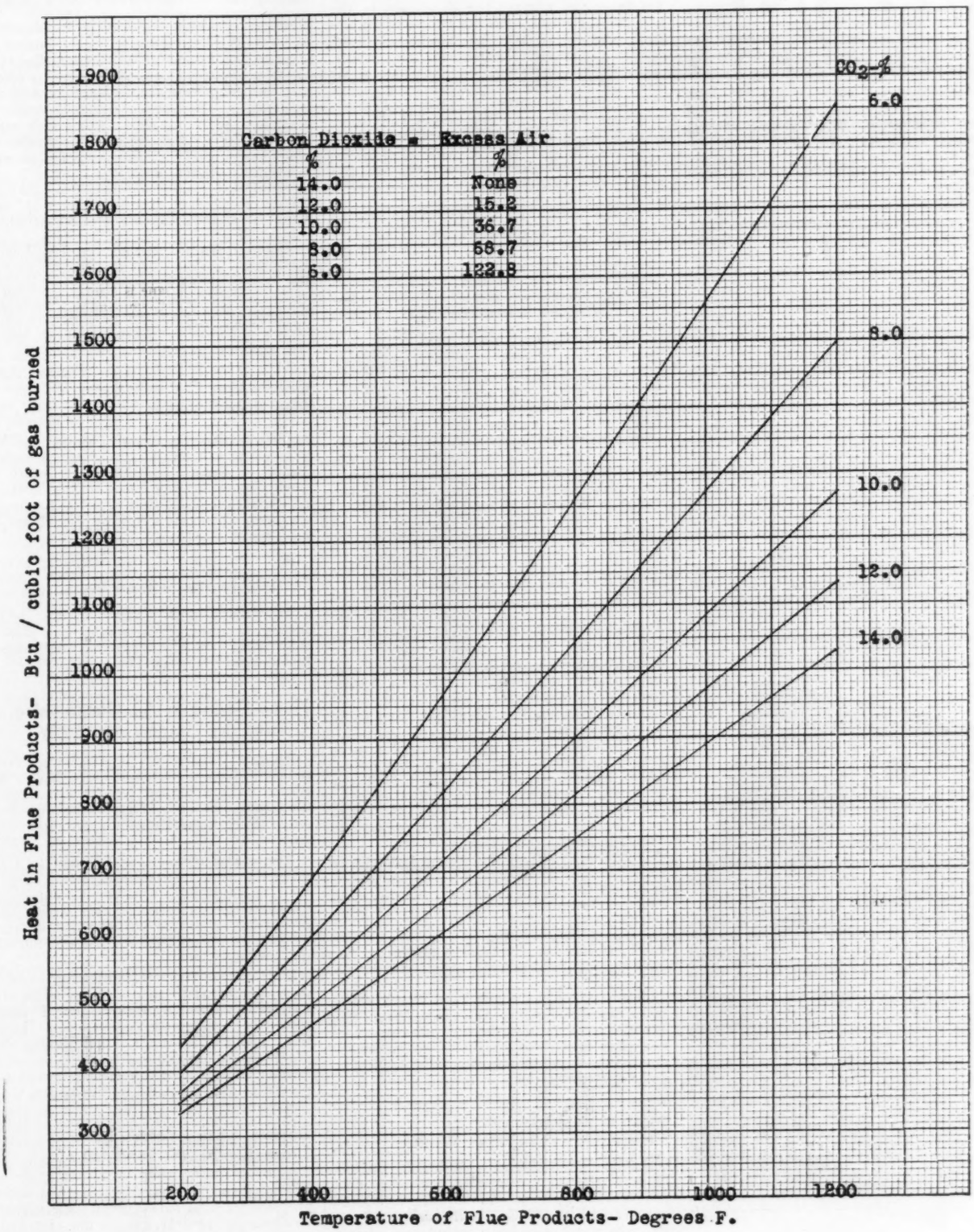
In connection with the combustion chart for commercial butane the following extract from Mr. Berry's chapter is pertinent:

"Commercial butane is a mixture of normal and isobutane with varying percentages of the higher and lower homologues such as pentane and propane. The heating value of the commercial butane may be taken at 3200 B.t.u. per cubic foot, and the specific gravity as 1.95.

"Butane requires 31.086 cubic feet of air to burn a cubic foot of gas, and the ignition velocity is approximately the same as that of


0.3 0.4 0.5 0.6 0.8 1.0 1.5 2.0 3.0 4.0 5.0 6.0
Electricity- Cents per Kilowatt-Hour
780
720
660
600
540
480
420
360
300
240
180
120
60
Thousand Btu per Boiler
To compare cost of propane with electricity follow vertical line from cost of propane per pound to intersection with propane curve then horizontal line to electricity curve then vertical line to cost of electricity. Example: Propane at 9.5 cents per pound will be equivalent in heat units with electricity at 1.5 cents per Kilowatt-Hour.
Electricity
Propane
Propane- Cents per pound
3 4 5 6 7 8 10 15 20 30 40 50 60

Cost of propane compared with cost of electricity.



Combustion chart for commercial butane.

propane. The flame temperature of butane is just slightly less than that of propane.

"With butane-air it is necessary to make special provision to reduce the excessive injection of primary air resulting from the high injecting power of the mixture and the small additional air requirement."

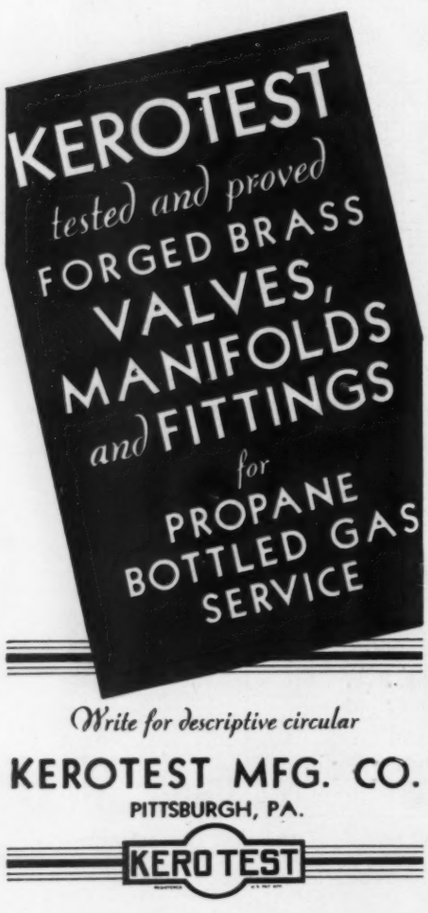
The accompanying curve shows the heat loss for commercial butane for stack temperatures up to 1200 degrees, and for various percentagesof carbon dioxide in the flue gases. It is pointed out that the chart may also be used for butane-air mixtures, this example being given:

"We find from the chart that with 6.0 per cent of carbon dioxide (equivalent to 122.8 per cent of excess air) and a stack temperature of 600 degrees F. the total heat in the flue products is 985 B.t.u. The 550 B.t.u. butane-air mixture contains 17.18 per cent of this commercial butane and since the air requirement and the flue products are all in the same proportion, the total heat in the flue products of a 550 B.t.u. butane-air mixture would be 985 x 17.18 per cent=169 B.t.u. The heat loss in flue products would be in this case 30.7 per cent."

Another section of particular interest in Mr. Berry's discussion prepared for the *Handbook of Butane-Propane Gases* is that which deals with the commercial cost of propane as compared with natural gas, manufactured gas, and electricity. One of the curves in this section appears on page 34, presenting comparative cost data for propane and electricity. From the curve it will be seen that propane under normal price conditions enjoys a marked economic advantage over electricity. It must of course, be considered that the curve shows relative costs of total B.t.u. actually delivered and does not take into account the difference in the utilization efficiencies of the two fuels. While these efficiencies may be considered practically the same for natural gas, manufactured gas, propane, and the butane-air mixtures it is common practice by many of the larger distributors to require a somewhat higher efficiency for ranges and water heaters to be used with propane, than is generally required for use with other gases. The new A.G.A. specifications for gas ranges also call for higher efficiency with propane.

On the matter of relative efficiencies of electricity and propane as related to comparative costs, Mr. Berry in his original discussion remarks as follows:

"Electricity can be used with high efficiency in top burner and oven cooking, and in electric space heaters and water heaters all of the heat liberated is usefully employed. However, a kilowatt hour of electricity represents only 3412 B.t.u. compared with 21,650 B.t.u. in one pound of commercial propane, and even if we assume a considerably lower average utilization efficiency for propane the heat usefully employed will cost materially less than electric energy except under conditions where electric energy costs are very low and propane costs very high. These relations are shown clearly in the curve of comparative costs."



Write for descriptive circular

KEROTEST MFG. CO.
PITTSBURGH, PA.

KEROTEST

Seven Kentucky Towns Served; Nine More Scheduled for Service

Kentucky Public Service Co., Inc., Elizabethtown, Ky., is now operating under franchises recently granted in the towns of Horse Cave, Cave City, Hiseville, Glasgow, Litchfield, Glasgow Junction, Smith Grove, serving these towns with natural gas from fields northeast of Hiseville.

The company also plans to build natural gas transmission lines to the following towns, where franchises have been granted: Elizabethtown, Labanon Junction, Hodgenville, Caneyville, New Haven, Taylorsville, Buffalo, Sonora, Bardstown, Upton, Shepardsville, Bloomfield and Clarkson.

Work on the distribution system in Hodgenville is in progress and will be started in the other communities shortly, with the nine towns to be supplied during the coming year.

New Process for Producing Benzol and Carbon Black from Gas

Patent rights in Canada have been granted the Anglo-Persian Oil Co., Ltd., Winnipeg, Manitoba, for a new benzol process. Natural gas is treated thermally with steam, producing carbon black and benzol, alcohol and derivatives from the residue gases.

Asks Permit to Serve Natural Gas in Tacoma, Wash.

Application was filed with the city council on November 15 for permission to serve natural gas in Tacoma, Wash. The applicant was Walter Metzenbaum, attorney, of Seattle, who states that he is acting for "clients and associates." Source of the supply was not named in the petition.

Defeat for Shepherd Bill

The Shepherd Bill designed to impose an excise tax of 1 cent and eventually 2 cents on natural gas distributed in Alabama, was killed in the senate.

El Centro Butane System Ready for Winter Service

Work was completed early in November on extensive improvements to the butane gas distribution system at El Centro, Calif., by the Natural Gas Corp. of California, according to R. L. Hayden, district manager at El Centro. Present construction work has included the laying of 6-, and 4-inch mains, the addition of three regulator stations, and the changing of the entire system to high-pressure from low-pressure.

Gas Appliance Exhibit at Lancaster

Southern California Gas Co., Los Angeles, has set up a gas appliance display room in the Kneip Hardware store at Lancaster, Calif., where the company now maintains its business office. Southern California Gas Co. serves undiluted propane-butane at Lancaster.

Citizen Gas Co. Introduces New Rate Schedule

Citizens Gas Co., Calais, Maine, has been granted permission by the New Brunswick Board of Public Utilities to introduce optional house heating rates in the towns of St. Stephen and Milltown, New Brunswick, Canada, where the company distributes butane gas.

Getting Ready to Build Plant

Mayfield Gas Co., Mayfield, Ky., is preparing to construct a butane gas plant in that town. Headquarters for the company are maintained in St. Louis, Mo.

Home Course in Air Conditioning Offered by Rutgers University

Rutgers University, (The state university of New Jersey) has just published a new course on the subject of Air Conditioning. The course is now being offered by home-study through the University Extention Division.

The course includes, in addition to a general discussion of the use of all types of fuels, an entire section on Gas Consuming Air Conditioning Equipment. This section treats of heating by gas, cooling and dehumidifying by gas, the steam ejector cycle and the silica gel system.

This course in Air Conditioning is offered as a companion to two previous home study courses conducted by Rutgers—the Manufacture, Distribution and Utilization of Gas, and the course in Heating and Ventilating. Both of these earlier studies have been widely recommended both as prerequisites and companion-courses to Air Conditioning.

Detroit, Mich., Voters Turn Down $2,000,000 Bond Issue

The city of Detroit, Mich., turned down a proposal for a $2,000,000 bond issue to finance bringing of natural gas to the city by the municipal government.

Detroit City Gas Co., serving manufactured gas there, has had several tentative plans for bringing in the new fuel, and the rejection of the bond issue by the voters is believed to give the gas company a better opportunity for going ahead with one of the proposals. Negotiations are reported under way, according to a statement credited to W. G. Woolfolk, president of the company.

Liquefied Natural Gas Corp. Going Ahead With Plans

Permission has been given to the Liquefied Natural Gas Corp., Minneapolis, Minn., by the city council of Wisconsin Rapids, Wis., to construct a liquefied petroleum gas plant there. Approval of the state utilities commission is necessary before construction can get under way. An application is now pending before that body. Franchise at Wisconsin Rapids was granted some time ago to the American Gas Construction Co., also of Minneapolis, and was recently transferred to the Liquefied Natural Gas Corp., and extended to June, 1933.

Liquefied Natural Gas Corp. is engaged in an extensive program for supplying liquefied gas to cities and towns in the Minneapolis territory. Tracy, Minn., where franchise was granted last month, has been selected as the central distribution point for bottled gas service to outlying towns. A site has been selected for the plant from which liquefied gas will be served through distribution mains in Tracy and which will act as a central storage depot for bottled gas service to many other cities and towns.

Kerotest Issues Bulletin on Brass Valves and Fittings

The Kerotest Manufacturing Co., Pittsburgh, Pa., has just issued a new 48-page catalogue entitled "Forged Brass Valves and Fittings for Mechanical Refrigeration," describing the company's line of forged brass valves and fittings, which have many applications for general use in the gas and related industries.

Many new types of valves, new construction features and new applications are pictured.

A copy of the brochure will be sent on request to the manufacturer.

Southern Counties Gas Co. Reports Net Profits Gain

Southern Counties Gas Co., Los Angeles, reported late in November net profits of $926,256 for the 12 months ended October 31 after all charges including depreciation, as compared with $831,495 a year ago, a gain of $94,761, or 11 per cent.

After preferred dividends there was a balance of $776,310 available for the common stock as compared with $681,555 last year. Pacific Lighting Corp. owns all the common stock in the company.

Natural Gas Development Co. Incorporated at Victoria, B. C.

The Natural Gas Development Corp. has been incorporated at Victoria, B. C., with authorized capitalization of $500,000. Registered offices of the company have been established at 1406 Dominion Bank Building, 207 West Hastings Street, Vancouver, B. C. The company will engage in the operation of a general natural gas development business.

R. R. Commission Restrained From Putting Interim Rates Into Effect

At a hearing before a three judge statutory court, sitting in the Southern California Gas Co.'s rate case, the California Railroad Commission was restrained from putting into operation the interim rate schedule which the gas company had been ordered to adopt on December 1. The rate hearing is scheduled to be resumed on January 17, 1933, at Los Angeles, before the Railroad Commission.

SCAIFE

I. C. C. CYLINDERS

A majority of distributors of Liquefied Petroleum Gas now use the Scaife cylinder.

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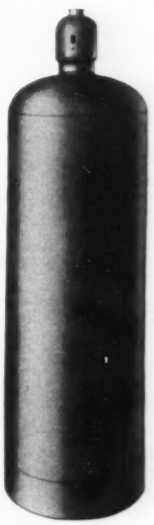
GOOD LOOKING



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Organization and Procedure for San Diego Change-over to Natural Gas

(Continued from Page 15)

1. A manual for change-over fitters and adjusters.

A printed manual, 4 x 7-inch size, which gave general rules and regulations to be observed by change-over employees; information on company organization, supervisors in charge of appliance work, working conditions, tools and equipment, safety instructions, order forms and notices, customer contact; instructions on appliance adjustment and also on service conditions to be met.

2. A field manual.

A printed manual, 5½ x 8½-inch size, which gave detailed information on residential appliance adjustments, listing changes to be made and parts to be used for the many types, designated by manufacturers' names. Information of the same type was given for numerous commercial installations such as hotel and restaurant ranges, linotype machines, bunsen burners, etc. A telephone directory listing company headquarters and district offices—ambulance, police, and fire departments—appeared on the first page of this manual; general rules and regulations covering safety, operation of automobiles, etc., also were prominently placed in the manual.

3. A catalogue of natural gas change-over material.

A printed catalog, 5½ x 8½-inch size, which listed appliance parts on hand for change-over—including the many kinds of orifices, lighters, springs, valves, washers, adapters, burners, cocks, gaskets, grids, jets, packing, pilots, plugs, screens, shutters, spuds, tubing, switches, radiants, and scores of other items each to be required in many sizes and styles. By use of this catalogue adjusters knew what was in stock, and unnecessary labor operations were thus avoided.

4. Team captains' manuals.

A mimeographed set of instructions to the 50 key-men, designated as team captains, which outlined their general duties in organizing their work, handling men, and using the work order system, accounting system, etc.

5. Commercial equipment instructions.

Mimeographed information for use of crew specializing on commercial installations.

6. Material display boards.

These boards displayed the appliance parts and equipment to be used in the change-over. They were exhibited during the school instruction and familiarized the workers with the various materials; each material item was numbered, corresponding to storage bin numbers in the company warehouse where parts were stocked. Team captains had photographs of these material display boards during the work in the field, enabling them to order equipment by bin number.

The above list is only a partial one, but indicates the extensive preparations which it was necessary to make in advance of recruiting the change-over workers and preparing them for their duties.

Coming now to the employment phase of the work, a special employment department was created, consisting of three interviewers. The first considered the applicant's previous qualifications; the second submitted him to a simple mechanical test; the third checked his residence qualification, preference being given to local workers. This special employment department interviewed 950 men, of whom 500 were employed. Beginning on August 1, a month before change-over, workers were hired in four groups of 125 each on four successive days. This division was followed throughout the adjusters' school, each group of 125 following the same phase of the "curriculum" at the same time, and moving as a group through the school.

At the outset of the school groups of eight men each were assigned to team captains. Captains were largely recruited from regular company employees, plus a few men experienced in change-over work in other sections of the country. Captains went through a two-weeks course of preliminary training, consisting of the same routine planned for the adjusters. Then the groups of eight men each were taken through the school by their respective captains, and remained under the same supervision throughout the change-over.

While the captains gave the actual instructions to their groups they in turn were under the direction of "supervising instructors," each in charge of a section of the appliance laboratory and also of the corresponding phase of change-over operations.

A supervisor was delegated to each of the following six operations:

1. Laboratory test on appliances and shop repairs; changes to appliances and burners.
2. Supervision of residential change-over crew foremen, assistant foremen, crew captains, fitters, adjusters, field headquarters, mechanics, clerks, messengers, etc.
3. Commercial change-over, with the same general organization as for residential change-over crews.
4. Materials, supplies, tools, equipment, transportation, communication system, etc.
5. Segregation and purging of the distribution system in the change-over zones.
6. Consumers' complaints, records, reports, orders, and general office work in connection with the change-over.

The adjustment school "campus" consisted of parts of two floors in the company's service building; a special tent (40 x 80-feet in size), which housed the meter and regulator department; and the appliance laboratory where the "students" received instruction and actual experience on the mechanical changes required.

A stock of 150 appliances of various kinds and makes was provided for the school, divided into sections—one for ranges, one for water heaters, etc.—in which many individual makes were available. Separate sections for commercial equipment, and for laboratory equipment such as bunsen burners and dental torches, were also set up.

Both the manufactured oil gas and the new natural gas were available at all times. Since the school took session long before the pipe line completion, natural gas was brought from Los Angeles Basin fields 80 miles distant in specially designed trucks. These carried four high pressure (250-pound) tanks with combined capacity of 9,000 cubic feet of natural gas. During preliminary appliance testing, prior to the school, natural gas was brought to the company's laboratory in ordinary oxygen cylinders. The special trucks had another important assignment in the change-over; they were taken to certain industrial and commercial consumers' premises before the general change-over began, making it possible to determine what adjustments would be required for proper combustion.

In working out a routine for the school instruction the plan followed was to rotate each of the 125-man groups through the various departments every day; each 125-man group spent one-half of every day in the laboratory; a two-hour session was held for each group every day in the auditorium, this consisting of instruction in the fitters and adjusters manual; at tent headquarters each group received two hours daily drilling in meter-reading, meter and regulator troubles, testing for leaks, etc.

Instruction in accident prevention, first aid, and resuscitation was an integral part of the school, this being handled by the company's safety department.

During the last 10 days of the one-month school each man was given a tool kit and sent to call on a "key" residence. Six houses were equipped with ranges, water heaters, and space heaters for this purpose, and a company representative was stationed at each in the role of housewife. Questions were asked relating to the men's mechanical work and the procedure of appliance adjustment, as well as other points of general policy. The purpose of this examination was not to eliminate unfit workers, but to help all students on their weak points. Those who did not show up satisfactorily were given a second examination after an additional period of training, and without exception all passed the second test. Very few were discharged for any reason during the entire schooling and change-over. The above examination was a most noticeable help in maintaining interest in the school routine.

Actual change-over work opened on September 2 and was completed on October 28—two days ahead of the carefully laid out work schedule. Zones were purposely kept small, in order to facilitate their completion in from one to three days. Customer notice cards were sent out two days in advance of adjustment work in each district, giving the date of the change-over and repeating the precautions to be observed.

Two district field headquarters were constructed on special truck trailers; in one end of each was an office, in the other a shop and storeroom. All supplies for field forces were issued from these headquarters.

After completion of a zone the headquarters was moved, like a circus, at night. Connections to telephone, gas and electric light service were maintained at all times, and the field headquarters were open 24-hours a day while on district location.

The staff at each field headquarters consisted of a storeroom clerk and a headquarters clerk (to whom team captains reported), and from one to five shop mechanics. These mechanics fitted appliances for natural gas service which could not be handled on consumers' premises. Connection to gas service made it possible to adjust these appliances to actual working conditions. Over 70,000 jobs of this kind were handled in field headquarters shops in the two-months of the change-over.

When gas was turned into a new zone and field headquarters were located, the scene was set for the change-over crew, consisting of several teams with individual captains, all working under a crew foreman.

The complete change-over crew for residential work was made up of about 375 men —combining three of the original 125-man groups. However, the first crew moved into a new zone consisted of 250 men and concentrated its work upon ranges and water heaters only, in residential installations. This crew made notes of work which would be required to adjust space heating equipment. The other crew of 125 men followed up within a week and adjusted the space heaters. The space heating crew took care of readjustments requested by customers, and calls which came into company offices were also routed to this crew whenever possible. This minimized the amount of special adjustment work required.

Messenger service was maintained between main or suburban offices and field headquarters.

Another crew of 125 handled commercial equipment. These adjusters were on the job at the hour specified by the customer, as previously ascertained through personal contact with each consumer. In many cases the full commercial crew would not be needed in a district, and surplus men were sent to help the space heating crew.

Gas was turned into each distribution zone at midnight, the old gas being purged out at critical points by being burned in a flare. Old gas remaining in house lines and meters was consumed by the breakfast load. Arrival of natural gas in the district was noted by observation of the flare.

Due to the unusually complete campaign of publicity and advertising the customers were well informed of the general purposes and procedure of the change-over, cooperating in a wholehearted way to eliminate hazards. Adjusters arrived on consumer's premises not later than the second day following natural gas turn-on, on the average. The entire change-over was consummated without serious accident.

Work orders were made up in advance and issued for every active meter as shown by the consumer ledger accounts. The accounts were kept up to date, 6,000 changes being made during the two-month change-over period, and necessitating corresponding changes in work orders.

At each "not at home" call tags were hung requesting the customer to arrange an appointment for adjustment of his appliances. There were 1,450 of these "not at home" calls.

Appliances which were not adjusted on first call were tagged "do not use."

Natural gas was scheduled to reach the downtown commercial district in San Diego at mid-week, but this program was changed to bring the gas in early on a Monday morning, just after midnight. This allowed time for preliminary adjustments on 350 larger commercial installations during Sunday and Sunday night. The entire change-over crew of 500 men moved into the downtown area by six o'clock Monday morning, completing this primary zone by six o'clock Tuesday evening. This zone is No. 21 on the map of districts illustrated with this article.

A special force handled gas-burning equipment in doctors' offices, beauty shops, laboratories, etc., bringing into the shop for adjustment such special equipment as bunsen burners, dental torches, marcel iron stoves, and the like.

In all, 4,280 commercial appliances were adjusted.

The following figures are of interest by way of recapitulation on the San Diego Consolidated Gas and Electric Co's change-over.

Total number of appliances adjusted	174,000
Total number of premises	62,000
Total commercial appliances adjusted	20,400
Appliances adjusted per customer:	
Residential	2.65
Commercial	4.82
Jobs completed at field headquarters shops	72,000
Automobile miles traveled during change-over*	197,000

The efficient handling of the physical problem presented in placing the San Diego company's 62,000 premises on natural gas service, without serious accident, is a splendid testimonial to the foresight of those in charge, and to the coordination of every department in carrying through the many essential steps into which the work was divided.

LOAD-BUILDING

It was of course foreseen that substitution of 1100 B.t.u. natural gas for 550 B.t.u. manufactured gas would reduce gas sales. In the San Diego company's experience this reduction came to approximately 47 per cent, with revenue dropping off correspondingly. The company is meeting the situation aggressively, has re-organized and added to its commercial department, and budgeted for increased advertising and sales effort all along the line.

Every available effective advertising medium is being employed, including newspapers, radio, outdoor advertising, cooking schools, the new consumer publication "Natural Gas News" mentioned earlier in this article, and numerous other promotional items. A recently completed consumer mailing piece, entitled "Natural Gas in Your Home," is an attractive booklet devoted principally to space heating and central heating, with additional sections on water heating and modern gas ranges.

Only in certain of its outlying districts does the San Diego company merchandise gas appliances. Its promotional program is therefore designed to place a maximum of direct support behind dealer selling. Work in the gas sales department has been allotted as follows.

In addition to the sales executive staff one representative specializes in surplus industrial gas sales and the larger commercial jobs such as apartment house heating water heating, and bakery conversions.

Another new business representative promotes commercial cooking in restaurants, cafes, hotels, hospitals, etc.

One man is in the field almost continually calling on domestic heating and water heating prospects.

A fourth representative will be located on the company's new display floor to exhibit the various domestic appliances and secure sales prospects.

The display floor mentioned above is being created by alterations to the company's main floor at San Diego headquarters, where a large, well-lighted space will be used for display of gas appliances. This space is available to local appliance dealers, upon invitation, to exhibit certain types of A. G. A. approved appliances and control equipment. To date arrangements have been made to show three makes of warm air furnaces, four floor furnaces, four console heaters, three radiant heaters, two gas steam radiators, one range, and three storage water heaters. Several additional ranges, furnaces, gas steam radiators and gas-fired boiler also will shortly be on display.

Recent study of the company's potential market has brought evidence of a large field for increased gas sales, both by greater use of existing equipment and purchase of additional appliances by present customers. From the appliance adjusters' reports made on each consumer's premises during the change-over, definite sales possibilities are known, for both new and replacement sales. This information has been transferred to individual cards and classified in files according to location. From these key cards small prospect cards are prepared for local appliance dealers. On the back of each key card is provision for a record showing the dealer to whom the prospect card has been submitted. The plan is for dealers to make report of their prospect calls on the individual prospect cards, returning these to the company to be filed with the key cards. In cases where sales are made both the key card and prospect card are transferred to a "sold" file. Should there appear to be a chance for future sales the cards are flagged and remain in the original file. Where no sale is deemed possible the cards are transferred to a "dead" file. The company plans to use direct mail advertising to live prospects.

Further prospects for appliance sales are being secured through use of coupons in newspaper advertising, in "Natural Gas News," and in the booklet "Natural Gas in Your Home." These coupons request the services of the company's house heating advisor, who has already made a large number of calls with a high percentage of sales for local dealers. Even more activity in this direction is anticipated with the arrival of cooler weather.

In several of its outlying districts the company is using its district electric appliance salesmen to promote gas sales. Since they have no gas merchandise to sell on a commission basis a schedule of bonus payments for gas appliances sold through their activities has been set up. This system has operated for too short a period to estimate its productiveness.

Intensive campaigns are contemplated to replace present solid fuel-burning equipment and also to replace manually controlled water heaters with automatic equipment.

The San Diego company is thoroughly alive to the new business opportunities created by the change-over, and is lending every effort to build up its sales curve as rapidly as possible.

*By team captains and other supervisors; adjusters traveled on foot.

Validity of Turner Valley Gas Conservation Act Upheld

The Supreme Court of Alberta, Canada, has upheld the validity of the act for conservation of Turner Valley gas, passed April 6, 1932, by the Provincial Legislature of Alberta.

There are 96 producing wells in the 12,000 acres of the Turner Valley field, and authorities decided early this year that unless measures for the conservation of the supply were passed immediately, the field could not last more than two or three years.

The act is administered by a board of three members appointed by the Alberta government. Its general purpose is to bring about conservation of natural gas by pooling or otherwise.

It is expected that litigation concerning the act will be taken to the higher courts, and possibly to the Privy Council.

Smith Now Manager at Canyon

W. L. Smith has been appointed manager of the West Texas Co., Canyon, Texas, succeeding Earl Robbins, deceased.

Records on Gas Appliance Servicing

(Continued from Page 21)

Temperature Controls—Room thermostats on house heating equipment, hot water thermostats on water heating equipment, etc.

Limiting Controls — Electrically actuated controls which function due to excessive temperature or pressure conditions, such as aquastats, pressure controls, etc.

Motor-Operated Controls and Valves — Electrically operated motor valve or controls which receive their electrical energy by the functioning of temperature and limiting controls.

Supply—Any troubles with the electrical supply which are not strictly a part of the gas appliance, such as interruptions, fuse blown, etc.

Water System: That part of the gas appliance which contains water.

Radiation and Piping—Refers primarily to house heating and water heating equipment and refers to troubles pertaining to that part of the system, such as poor venting, circulation, etc.

Controls—Pressure and temperature relief valves and their controls which are a part of the water system.

Section, Tank, Etc.—Those parts of the appliance which contain the substance to be heated by gas (water in most cases), leaks, cracked section, etc.

Supply and Miscellaneous—Miscellaneous troubles in the water system such as liming, dirty water, pressure troubles, etc.

Instructions on Operation and Use: This classification includes calls on which no trouble is found with the appliance, but was made because the customer apparently was not familiar with its operation.

High Bills: When not caused by a distinct fault in the appliance.

Miscellaneous: Miscellaneous repairs on such parts of the appliance which have no bearing on its operation, such as cracked finish, broken parts (not parts containing gas or operated by electricity) and troubles not otherwise classified.

Form No. 2—Special Appliance Study Form

This form is intended to serve as an appliance history record applicable to any particular appliance on which a service study of each one in use is to be kept, either temporarily or otherwise. It can be used to particular advantage in making a temporary history record of new gas appliances sold.

Forms No. 3 and No. 4—Special Individual History Record Form

In view of the fact that most companies which sell house heating and refrigeration appliances find it to their advantage to keep history records on each of these appliances sold for the purpose of determining service requirements and costs of servicing on this type of equipment, two forms are presented herewith covering such information that should be kept on these appliances.

Companies which have kept special records on certain gas appliances have invariably found that information obtained has been particularly valuable to them, and it is therefore felt that consideration should be given to keeping special records on other appliances on which service work has more or less been lumped together with other work.

Information on Appliance Performance from the Customers' Viewpoint, and Performance Data on Appliance Servicing Personnel:

It is essential to have a reasonable amount of information on appliance performance from the customer's viewpoint. This can be determined to a large extent by the nature of the service call received from the customer using the appliance and how many repeat calls are made to get the customer satisfied. All this can be brought out to a large extent by studying the service calls received.

Appliance servicing personnel can function in such a way that it produces a high quality of service. It is essential to have performance data on men in the field in order to be sure that they are producing up to capacity and ability.

One effective way of accomplishing this is to provide a standard field report for each job. This report can be arranged so that it is a report of the job done, showing work done and time required. When summarized on a payroll sheet or work sheet it will show how productive each man is in his work.

A study of repeat calls will also show how efficient the men are in doing a job that satisfies the customer on the first visit.

Twelfth Annual Meter Short Course

FINAL program details for the Twelfth Annual Gas Meter School and Conference to be held at Ames, Iowa, December 6, 7, 8 and 9 have been announced by W. E. Derwent, president of the Mid-West Gas Association which, in cooperation with the Engineering Extension Service of the Iowa State College, sponsors the school.

The committee planning the Conference this year was chairmaned by Robert L. Klar, engineer of distribution, Des Moines Gas Co., Des Moines, Iowa, the following serving with him: Geo. A. Lane, Chicago, Ill.; Lester J. Eck, Minneapolis, Minn.; Arnold C. Rathkey, Waterloo, Iowa; W. A. Pike, Marshalltown, Iowa; D. C. Faber, Ames, Iowa; L. W. Mahone, Ames, Iowa; C. E. Williams, Sioux City, Iowa; A. T. Barrett, Chicago, Ill.; J. M. Drabelle, Cedar Rapids, Iowa; R. F. Galpin, Muscatine, Iowa; A. L. Fritchey, Pittsburgh, Pa.; Howard Peirce, Davenport, Iowa; and C. I. Merrick, Ames, Iowa.

Sessions will open at 11 A.M., Tuesday, December 6 and extend through to 1 P.M. on December 9 with the following papers and addresses scheduled for the 4 days:

"Address of Welcome," Prof. D. C. Faber, Director Engineering Extension Department, Iowa State College.

"Outline of Course," Robt. L. Klar, Chairman, Short Course Committee.

"Preparation of House Heating Furnaces Before Conversion," W. J. Dougherty, Sioux City Gas & Electric Co.

"Standby Apparatus for Peak-load Equipment," Western Gas Construction Co., Fort Wayne, Ind.

"Mixing of Gases," G. M. Arnold, Cutler-Hammer Co., Chicago, Ill.

"The Vacuum System of Cleaning Services," E. G. Campbell, Peoples Gas Light and Coke Co., Chicago, Ill.

"Oil Fogging, Its Purpose and Results," Lester J. Eck, Minneapolis Gas Light Co., Minneapolis, Minn.

"Servicing and Adjusting House Heating Equipment," Edward Kennedy, Iowa-Nebraska Light & Power Co., Lincoln, Neb.

"Testing of Orifice Meters," A. D. MacLean, Pittsburgh Equitable Meter Co., Pittsburgh, Pa.

"Development in Gas Meters." Jointly, American Meter Co., Sprague Meter Co., Pittsburgh Equitable Meter Co.

"Installation of House Heating Equipment in Large Numbers," R. H. Luscombe, Des Moines Gas Co., Des Moines, Iowa.

Time has been allotted on each day's program for the inspection of exhibits, which will remain set up until 2 p.m. of the final conference day.

Entertainment features include a smoker at Hotel Sheldon-Munn, on December 6, at 8 p.m. at which L. W. Mahone will be host, and a banquet scheduled for 6:30 p.m., with C. I. Merrick as toastmaster.

Southern Gas Assn. To Meet in Washington, May 2, 3 and 4

At a meeting of the Executive committee of the Southern Gas Association, held in Birmingham, Ala., on October 17 the dates of May 2, 3 and 4, 1933, were definitely decided for the next annual convention, the place to be Washington, D. C. Shoreham Hotel has been designated as headquarters. According to S. L. Drumm, industrial engineer of the New Orleans Public Service Inc., and secretary of the Association, unusually interesting subjects and outstanding speakers were selected for this next meeting, which will be the Twenty-fifth Anniversary of the founding of the Association. At this meeting in Birmingham a meeting of the Southern Regional Sales Conference Committee was held, and a program arranged for the next convention of that body.

Bristol's Instrument Co., Ltd., Established in London, England

The Bristol Co., Waterbury, Conn., announces the establishment on October 1, 1932, of a factory at London, Eng., under the name of Bristol's Instrument Co., Limited, incorporated under the Companies Act of 1929.

Since the year 1889 The Bristol Co. has sold its line of recording instruments in that country through J. W. & C. J. Phillips, Ltd., as sales agent.

The plant is located at 144 Pomeroy Street, New Cross, London, and consists of an office building and a new two-story factory building of modern construction. The factory is equipped with machinery, tools and testing equipment, and will manufacture and service the complete line of Bristol's indicating, recording and controlling instruments.

New High Pressure Storage at Monrovia; Plan Whittier Holders

Four new high pressure natural gas holders with a total storage capacity of 1,000,000 cubic feet and representing an investment of over $65,000, were recently completed by the Southern Counties Gas Co. of Los Angeles at Monrovia, Calif. After their completion and final approval tests had been made the holders were immediately placed in service.

Advantages of Automatic Control

(Continued from Page 18)

In any hookup of automatic control for boilers, extreme caution is necessary when damper controls are used. Loose linkage, or failure of a damper control to operate causes the fire to choke or go out, with the resultant hazards. Following are some test results on various installations, all of which point out the savings in attendant's time by use of automatic control over manual control, and the high efficiencies consistently maintained.

One of the most widely fluctuating loads is that of the Fruitvale powerhouse of the Southern Pacific Co. The load varies with the movement of trains, which at times is very heavy. Fig. 1 shows the capacities of the regulators used, and Fig. 2 shows the boiler efficiency at various loads, as effected in both instances by automatic louver control, and in one instance with dampers hand set for the various loads. Owing to rapid load fluctuations, the damper is left set for maximum load, and the louvers take care of variations in gas supply by controlling air for combustion.

One of the largest jobs regulators are called upon to handle is that of the Spreckles Sugar Co., Salinas. Three Wilgus precision pilot regulators handle 28 high pressure boilers. Fig. 3 shows a 24-hour period of operation, using 23-250 h.p. boilers and two 500 h.p. boilers. During this period, 8,219,736 cubic feet of gas were consumed, at high efficiency.

The efficient 24-hour control of a galvanizing kettle requires good, properly selected equipment and valves. Fig. 4 is a portion of the chart from the set-up at the Hubbard and Co. plant, Emeryville. In this installation Leeds-Northrup three-position control is used, high fire, average fire, and low fire. For night use, the main set of burners is turned out completely, and the control operates a small valve on the "holding" burners. The advantage of automatic control becomes manifest in such an installation as otherwise frequent attention day and night would be necessary, and overheating would cause short kettle life. Fig 5 shows the valve and motor mechanism.

Fig. 6 is a view of a large core oven showing the automatic controls at the Navy Yard, Mare Island. This oven is also used for drying molds and annealing bronze propellors up to 800° F. The equipment consists of Wilson Maculen controller, Atco Valve and G. E. Telechron time clock. A Maxon magnet release valve protects the oven from overheating in case of power failure, which might leave the burners on high fire. Huge molds are dried over a period of several days at times, always under perfect temperature control.

Fig. 7 shows the control equipment on a Knapp furnace located at the Pacific Foundry, Ltd., San Francisco. This equipment controls the intricate cycle required in annealing KA-2 Metal.

The Merritt System is used on the boilers in the plant of the Pratt-Low Preserving Co., Santa Clara. A test made at this plant gave the data in Table No. 1. It is difficult to conceive of any manually controlled job that could be held to such ideal performance as the data from this test show.

Central station steam generating units place great trust in automatic control equipment in vital portions of the operating cycle. The new modern 50,000 horse-power units of the Pacific Gas and Electric Co. utilize the Bailey equipment for control of combustion and fuel requirements of the boilers, which operate at 1400 pounds per square inch, and Leeds and Northrup equipment for controlling the temperature of the steam leaving the reheat chamber. The operation of the fuel control is as follows: The rate of supply of fuel and preheated air is controlled by the steam pressure, in approximately correct proportions, the major changes in fuel and air being governed by changes in steam pressure. The ratio of fuel to air, to maintain best combustion efficiency is accomplished through the steam flow—air flow relation of the Bailey meter.

For the reheated steam control, after passing through the reheat portion of the boiler, it obtains its final proper amount of heat by passing through a steam heater heated by 1400 pound steam. This heater has a bypass, so that should the reheated steam go above 750° F. it is passed by the high pressure heater. Should it still be too hot, portions of it are passed through a cold feedwater heater also termed "desuperheater." All of these operations are performed automatically, with the final result that the steam entering the low pressure turbines is at exactly 750° F.

Fig. 8 records the control of temperature for the period of an hour, in operation of a gas-fired mattress sterilizing oven. Proper temperature was 230°.

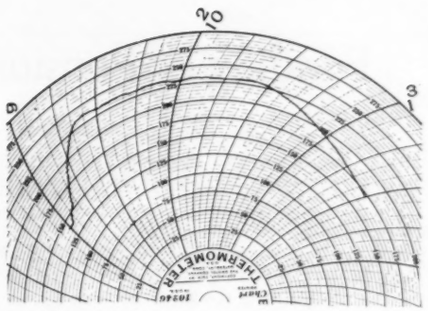

Fig. 8.

The installation is at the plant of the Burns Mattress Co., San Jose, Calif., and uses Robertshaw control equipment. On-and-off control, hooked up to make it of the throttling type, is used.

From the above and many other possible examples within the experience of all industrial gas salesmen and engineers representing industry as a whole, it is readily seen that the efficient functioning of industry to-day depends to an increasing extent on the adoption of automatic control. From the gas industry standpoint automatic control, in conjunction with basically correct oven or furnace equipment, will aid greatly in selling gas and keeping it sold.

TABLE NO. 1

Load on Boiler	*Maximum*	*Average*	*Minimum*
Burner pressure, lbs. per sq. in.	2.75	1.50	.75
Steam pressure	125	125	125
CO_2, %	10.5	10.5	10.5
O_2 %	2.7	2.7	2.7
CO, %	0	0	0
Excess air, %	14.0	14.0	14.0
Stack °F	560	535	480
Stack draft	0.20	0.15	0.06
Gas per hour, std. c.f.	13,020	9,690	6,720
Combustion efficiency, %	79.3	79.8	81.3

Major Installations Build Gas Refrigeration Load

Several installations of interest are reported by Electrolux Refrigerator Sales, Inc., Evansville, Ind.

Peoples Gas Light & Coke Co., Chicago, Ill., W. R. Evans, new business manager, completed the installation of 100 Electrolux gas refrigerators in the Lavergne-Madison apartment house, 5000 West Madison St. The refrigerators were delivered in five large trucks, the gas company taking the opportunity to call the public's attention to the installation. Each truck in the procession carried a sign "Here Comes Business."

Another noteworthy installation is that at March Field, Calif., headquarters for the Seventh Bombardment and 17th Pursuit groups of the United States Army Air Service, where 50 gas refrigerators have been installed in officers' bungalows. The eastern division of the Southern California Gas Co., under H. G. McAllister, division manager, supplies natural gas for their operation.

The Oceanographic Department of the University of Washington at Seattle has installed gas refrigeration on board the Catalyst, a 75-foot vessel which is part of the scientific equipment for the laboratory. The ship has accommodations for a party of 12 and a crew of four. Its cruising radius is estimated at 4,000 miles. The galley is entirely gas equipped with an Electrolux refrigerator, a water heater and gas range all fueled with "Flamo."

Border Station at Carthage

Cities Service Gas Co., Bartlesville, Okla., has rebuilt its town border station at Carthage, Mo. The work was under the supervision of C. A. Gibson.

Funding of Pension and Benefit Plans

(Continued from Page 23)

probably, the nearest and best experience that we have is our experience with Workmen's Compensation.

Where such funds should be placed is a topic in itself. The full control of the funds by the company in the form of reserves or trust funds, permits a flexibility of administration and an application of the benefits exactly within the intent of the plan. Placing these funds with a trustee throws an additional assurance around their conservation, as well as permitting their full claimance as a tax deduction, providing they comply with the tax regulations. Placing the monies with an insurance carrier, increases the amount of protection and assurance as to the conservation of the principal, as well as the prospect of fairly constant interest earnings.

If you so choose, you can take advantage of both the flexibility of self-administration and the safe-guarding of the amount of the funds, by drawing a proper agreement and placing the monies with a carrier. The larger mutual companies' practices have undergone considerable change for the better on this subject. It has been realized that a plan can be solvent without the tremendous initial deposits and without the absolutely unnecessary extra loadings, covering such things as short term cancellation and other penalties so essential and so long a part of individual insurance, and until recent years, connected with group insurance undertakings. All of these have been objectionable to industries which have been attempting to conquer this problem, particularly if they had a large accrued liability.

Regardless of whether the benefits are funded through a trustee, insurance carrier, or company reserves, the inherent differences between the funds as so briefly indicated here will continue to exist. There is a flexibility to separate funding which will meet future changes, if necessary.

This is particularly true if the pension fund is not dedicated to the provision of individual annuities prior to the employee reaching retirement age. An employee is not a pensioner until he reaches retirement age. Unfortunately, we cannot tag the survivors. If the fund is kept intact and unassigned, future plus and minus changes can be met. The combining of these funds usually courts insolvency. Due to the fact that the pension and disability funds will continue to build up in the earlier years and in some cases, to very large sums, those who are uninformed, and successors who may be unimpressed, will succumb to the temptation to pay benefits which the original forecasts of costs never contemplated, and for which provision has never been made. The size of the pension and disability funds, due entirely to the fact that the peak of pensioners has not been reached, and the average age is still low, serves as a blind in concealing the deficiencies which have resulted from unfortunate generosities. This is particularly true in the case of disability benefits. Administrative bodies and benefit committees find it easy to grant benefits. I cannot elaborate further. Might I say, however, that it is in recognition of the uninformed condition of industry as to the reasons for such segregated accumulations of funds, that insurance companies have chosen to propose to prospective clients a composite or package undertaking, in which they will assume sole responsibility for its adequacy or its accuracy. It is not to be inferred that they can accomplish the impossible and deal with this undertaking as a whole. On the contrary, it is a commentary upon our own lack of understanding, because they, in making their proposal, have segregated the undertaking for consideration and for forecasting the costs, but have assembled it for presentation only.

Conclusions

The separate funding of the benefits is something to be preserved and guarded, as it has many virtues and no real faults. I have only this admonition as I end this discussion:

Whatever you decide to do in establishing a schedule, sufficiently acquaint yourself with the problem so that you will believe in the existence of the present cost of these future benefits; and that you will commence immediately, if you have not already done so, fully to fund them. If you believe in these objectives, and if you understand the characteristics of the funding, you will find that you can:

(a) provide minimum existences after retirement; or rather, that you will not wish to provide anything less than such;

(b) that you will wish to pay death benefits in a sufficient amount and over a period which will enable the employee's family to readjust itself to the changed conditions and the absence of its provider;

(c) that you will pay disability benefits over a period which will permit the employee to recover, except in the most protracted and permanent cases; and in an amount which will enable the employee's family to adjust itself; and

(d) that you will subordinate sentiment and elevate practical reasoning—the same as you have in conquering other problems.

(e) As you proceed farther and farther into the problem, you will become more and more convinced that *relief of need* is your rule-of-thumb measure.

(f) You will probably find that the annual expenditure for providing these benefits will be reasonable in total—will be within your means—and will be fair to your stockholders and your consumers.

(g) You will find that this is a cut and try task—you will find that advice from counsel entitled to an opinion on this matter will be well worth its expenditure. May your counsel's viewpoint be not too biased by the commissions which he sees from the standpoint of insurance sales, or by the recurring fees which he sees in the necessity for recasting the annual contributions to a trust fund.

Fortunately, as an industry we are young. This is particularly true of public utilities on the Pacific Coast. If we treat with this matter in the immediate future, it will probably not be a problem.

When your report is finally drawn, take the time to fully acquaint yourself with its contents.

You may not live to see the proof or disproof of your forecast, but your carelessness in giving consideration to the problem, or your failure to thoroughly dissect the proposals made by your advisors, may hand on to a future management a problem which they cannot meet.

May this somewhat sketchy presentation assist you to approach the problem of designing the benefits of your new or revised plan with a more complete understanding, and with more reverence for its magnitude.

Action Sanctioning Purchase of Casper Gas System by City Rescinded

The city council of Casper, Wyo., on November 18, voted to rescind its previous action which sanctioned the purchase by the city of the gas distribution system of the New York Oil Co.

The action of the council on that date followed the announcement that C. D. Munroe, judge of the district court of Natrona county, had granted a 30-day extension for obtaining a declaratory judgment defining the property rights of the New York Oil Co., serving natural gas in Casper.

Foremen of Lone Star Get Together in Annual Meeting

The annual foremen's meeting of the Lone Star Gas Co. and the Lone Star Gasoline Co. was held at Pleasant Grove, Texas, on Thursday, November 10. The meeting was attended by F. L. Chase, manager, Chester L. May, vice-president and operating manager, Community Natural Gas Co., and other executives of the affiliated companies. At 6:30 a barbecue was held at the Cheaney plant for the foremen and visiting officials.

Itasca and Allouez, Wis., Get Gas Service in November

Allouez and Itasca, Wis., were scheduled to have gas service during the last week in November, according to statements credited to W. C. Lounsbury, manager of the Superior Water, Light and Power Co., of Superior, Wis. The company extended its mains to the districts at an expenditure of about $70,000.

Fields Transferred to Fairbury, Neb., Rose Goes to Forest City

Earl Fields, manager of Peoples Natural Gas Co., Forest City, Iowa, has been transferred to the office of the company at Fairbury, Neb., as manager. His place at Forest City has been taken by W. H. Rose, formerly at Omaha, Neb. The company is an operating subsidiary of Northern Gas and Pipe Line Co.

Successful Range Selling Campaign for Wisconsin Utility

Wisconsin Public Service Corp., Milwaukee, Wis., in a 60-day campaign which ended October 1, sold 225 gas ranges, or 160 per cent of the quota. Eighty-two of these were sold to customers not using gas previously. C. R. Phenicie is new business manager for the company, a Byllesby-owned utility.

Kentucky Utilities Co. Plans To Build Line to Danville

Kentucky Utilities Co., Louisville, Ky., plans to begin construction of a gas transmission line from fields in Boyle County, Ky., to Danville, Ky., where the company serves manufactured gas.

"ELECTROLUX has opened the door to a profitable new load because it offers a convenience which every housewife wants"

This is the statement of

LEONARD J. SAXUM

manager of the

Princeton Gas Company, Princeton, Ill.

A tiny gas flame makes constant, steady cold

TODAY, automatic refrigeration is the *one* convenience which every housewife wants more than anything else. Writes Mr. Saxum, "Many families which have refused during the past three years to make replacement appliance purchases have however found their way clear to buy an Electrolux." That's because Electrolux not only offers the last word in modern refrigeration; but more than that, it provides a real economy over other ways of refrigeration, and hence is a logical purchase for even those families which must figure closest.

As a result, aggressive, sales-minded gas companies throughout the country are enjoying a profitable new *untapped* load. *Not* a replacement, every installation of Electrolux adds 1500 cu. ft. monthly to a consumer's present requirements; takes the small convenience user out of the non-profit class.

Right now is the time to plan (if you have not already done so!) to put Electrolux in the limelight of *your* merchandising and sales activity for 1933. Let the new Electrolux load aid in taking up current industrial slack on your lines! We've prepared material that will vastly help in developing the profitable Electrolux business in your territory. Write us for details. Electrolux Refrigerator Sales, Inc., Evansville, Ind.

ELECTROLUX THE *Gas* REFRIGERATOR

READY!

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PERSONNEL DIRECTORY of the Gas Industry

Order at Once
Edition Limited

The only directory giving the personnel of gas utility district offices as well as headquarter companies, arranged by states and divided as to distributing companies, pipe line companies, producing companies and holding companies. Each distributing company lists the kind of gas served—pressure—B.t.u. content—number of meters and approximate population—and whether or not each company merchandises.

Correct as of May 15, 1932, it is the most complete and up-to-date directory available for the 22 western states, Alabama, Mississippi and Georgia.

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Please send me.....**copies of the "Blue Book" Personnel Directory of the Gas Industry at $**.....**per copy, for which I enclose remittance of $**.....

Company name .....

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Steady Growth in A. G. A. Laboratory Program Evident in Review

ON MAY 23, 1924, or approximately eight and one-half years ago, the Executive Board of the American Gas Association gave final approval to the establishment of a national testing laboratory.

One of the outstanding services of the laboratory during the years of its operation has been the testing and certification of over 21,000 models of domestic gas appliances.

Each year the extent of the laboratory's testing and inspection operations have shown a marked increase. The volume of testing and inspection work completed during the last fiscal year when compared with that for the first full year's operations shows an increase of approximately 400 per cent. Although the extent of such activities during the last year was slightly less than that for the previous fiscal year, the record of work done indicates exceptional activity in the appliance manufacturing field, especially in view of general economic conditions.

Progress also has been made by the Pacific Coast branch laboratory, which began operations in Los Angeles in May, 1931. Since its establishment it has tested and approved over 1,000 models of gas appliances, and during the last fiscal year accounted for more than 22 per cent of the total testing business of both laboratories. It is estimated that the saving in freight transportation charges alone to Western manufacturers during the past year exceeds $11,000, while savings to manufacturers in traveling and other expenses, which would have been entailed had appliances tested been shipped to Cleveland, probably exceeds $5,000. Coupled with this saving there is the additional advantage to manufacturers of being able to market newly approved appliances from two to three months earlier than would otherwise have been possible.

Twenty-eight Pacific Coast manufacturers have joined the American Gas Association during the last 18 months, primailry as a result of the establishment of the Los Angeles laboratory. All of these companies submitted appliances for approval for the first time during this period. During the same period of time some 10 additional California cities, as well as one in New Mexico and others in Texas and Arizona, adopted ordinances limiting the sale and/or installation of domestic gas appliances to those tested and approved by a recognized testing laboratory.

Of comparable importance with the laboratory's progress in the testing and certification of appliances has been its record in the field of research. Records show that research in the development of, and revision to, requirements for gas appliances increased more than 600 per cent during the period from 1926 to 1932. During the past year 46 separate investigations in this field were completed, resulting in the preparation of 46 reports totaling 762 pages of discussion and data, and including 50 drawings, 29 photographs and 52 graphs. All of this research is conducted under the direction of the A.G.A. Approval Requirements Committee and its sub-committees. Twenty-one meetings of requirements committees were held during the course of the year. Three sets of requirements were published, five sets are now in the final stages of completion and seven sets of new and revised requirements were completed during the year and are now in the hands of the American Standards Association awaiting final approval.

Six new sub-committees of the A.G.A. Approval Requirements Committee were organized during the year to draft requirements for gas appliance accessories and controls, as well as for additional types of appliances, making a total of 22 standing committees now engaged in preparation and revision of requirements.

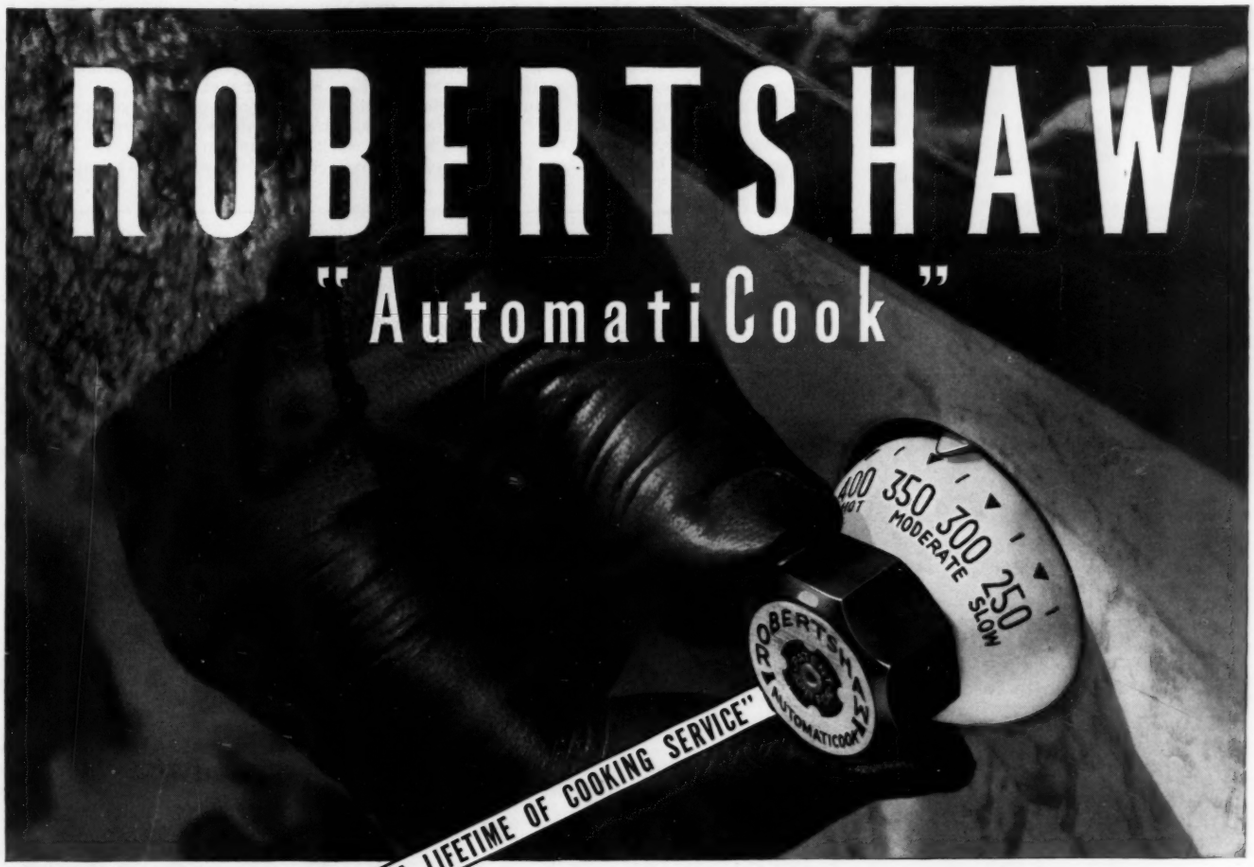
Research work other than in the preparation of requirements showed an increase for the past year of approximately 400 per cent over the same period in 1927. In recent years a number of research projects have been assigned to the laboratory not only in the field of utilization, but also those concerning production and distribution. Early in 1927 the laboratory undertook an investigation under the direction of the Mixed Gas Research Committee to determine the permissible limits in blending gases from the standpoint of variations in specific gravity, heating value, and chemical composition and still retain satisfactory appliance performance. This program was later extended by the committee as the need for additional information became apparent, until it covered practically the entire field of gas mixing problems. This investigation proceeded continuously for a period of five and one-half years and was completed during the past Association year.

Of importance also is the Pipe Joint Research Investigation being conducted, under the direction of the Pipe Joint Committee, at the laboratory in Cleveland. The original program for the study of bell and spigot joints which was decided upon by the committee was completed during last year. As a result of this investigation it has been possible to prepare definite recommendations for the construction and repair of such joints. Another important development of this work has been to stimulate thought and development in joints available for use as well as methods of repairing them. An extensive investigation of cast iron pipe joints carried out for the Cast Iron Pipe Research Association has also been completed and final reports prepared and submitted for approval. Last year marked the beginning of a study of welded joints having for its aim the development of a non-destructive test method for field use. A working model of an instrument for determining the soundness of welds has been developed and study is now being made to determine the best methods of application in order to enable it to give the most satisfactory results.

Research in the industrial utilization of gas was continued during the year on three important projects for the Committee on Industrial Gas Research. These include "A Study of the Characteristics of Burning Gas with Preheated Air," "The Elimination of Noise in Industrial Gas Burners" and "Research in Fundamentals of Combustion Space Requirements in High Temperature Gas Furnaces."

The first of these investigations was concluded during the past year and a final bulletin published, copies of which may be secured upon application to Association Headquarters.

Considerable progress has also been made in the study of the fundamentals underlying combustion space requirements in high temperature gas furnaces. Data on the effects of the size, shape, number and location of flues, with a combustion space of a given size and shape, were assembled. The effects on the combustion space requirements of us-



NEW MODEL "F" FOR TABLE TOP AND CONSOLE RANGES

MODEL "K" FOR CONSOLE RANGES

Win New Business with ROBERTSHAW

- And win it now!
- For more women are cooking their own meals than ever before.
- And when a woman does her own kitchen work, she rightfully feels that she should have a modern range, equipped to help her in every possible way.
- That means a Robertshaw . . . the cooking control she knows most about through years of advertising and the good reports of her friends.
- Dealers know this just as well as housewives . . . and they also know that it doesn't pay to handicap their selling work by trying to sell a range with a "just as good" oven control, no matter how alluring the price may seem.
- With over 150 Robertshaw equipped brands to choose from, you can always offer the last word in real value and have the selling help of the Robertshaw behind every range you sell.

The Robertshaw Lithographed Display will "dress up" your window or floor display. It's free . . . . write for it now.

ROBERTSHAW THERMOSTAT CO.
YOUNGWOOD · · PA.

MADSEN CUISINE 34
. . . 1934's Range Today

Truly this range is more than a year ahead in design, construction, and economical operation.

CUISINE 34 installed *now* will give you 1934 operating efficiency plus low operating costs that make your CUISINE a most wise investment for 1932. Write for details.

Madsen Iron Works, Ltd.

P. O. Box 601, Huntington Park, Calif.
(Suburb of Los Angeles)
San Francisco Factory Representative:
Fred R. Sanford, 837 Howard St.
Madsen Hotel and Restaurant Kitchen Equipment
Sold by Leading Equipment Dealers

***Payne* Gas Furnaces**

give every owner maximum heating luxury and economy!

Standardize on this well established line and build customer satisfaction, creating desired public relations as have hundreds of gas companies throughout the country.

Payne Furnace & Supply Co.
Since 1914
Beverly Hills, Calif.

ing a different number of burners of the same type has also been investigated.

For some time the need of standardization of terms and definitions used in industrial gas utilization has been recognized; consequently the Committee on Industrial Gas Research assigned the laboratory the task of preparing material of this nature. Through the cooperation of industrial gas engineers of member companies, such a bulletin was finally completed, approved by the Committee and published for distribution. Copies may be secured upon application to Association Headquarters.

Notwithstanding adverse economic conditions, the laboratory has shown an increase in work accomplished in every line of its activity during the fiscal year just ended.

Community Natural Adds 659 Ranges and 440 Water Heaters

Two hundred electric ranges and 90 electric water heaters have been replaced by gas appliances sold by the Community Natural Gas Co. of Dallas, Texas, on all its properties during the period beginning January 1 and ending October 15.

In addition, gas ranges have replaced 172 ranges operated by fuel other than electricity, and gas water heaters have been installed in 59 homes formerly using some other fuel. Replacing worn out gas equipment, 247 new gas ranges and 206 new gas water heaters have been sold. Forty gas ranges and 85 gas water heaters were placed in homes which had neither range or water heater before.

This makes a total of 659 ranges and 440 water heaters which have been sold by Community Natural Gas Co. employees in the 16 divisions of the company during 10 months' time.

Permit to Extend Peoria Line to Several Suburbs

Central Illinois Light Co., Springfield. Ill., has been granted permission to construct a natural gas transmission line to serve residents of several suburbs of Peoria, Ill. The proposed line will extend from the end of the Peoria lateral from the Panhandle Eastern Pipe Line Co.'s main line, through Creve Coeur and East Peoria, and along the state highway to the Peoria county side of the Illinois River, and thence to the gas works of the company at Peoria. Work will probably be commenced some time in the Spring.

Natural Gas Transmission Line to Dana, Ind., Gets Under Way

Work on an extension from the main line of the Indiana Gas Distributing Co. to Dana, Ind., is well under way, where the company will be serving natural gas shortly. Paul G. Miller is district manager for the company, with his headquarters being at Indianapolis. Company headquarters are maintained at Columbus, Ohio.

Stockton Hospital to Switch to Gas Service on January 1

Pacific Gas and Electric Co., San Francisco, Calif., has the contract for supplying the San Joaquin General Hospital at Stockton, Calif., with natural gas, instead of the fuel oil now being used. The change will become effective on January 1.

Line Complete to State Hospital

Southern Counties Gas Co., Los Angeles, recently completed a 6-inch line from its main line to the Camarillo State Hospital, near Camarillo, Calif.

Fuel Oil Deliveries Decline 11 Per Cent in 1931

According to a statement issued by the United States Bureau of Mines, Petroleum Economics Division, as of November 16, railroads, steamships, manufacturing plants, commercial and domestic heating and foreign trade all required less gas, oil and fuel oil in 1931 than in 1930. Deliveries of such oils in 1931, as reported to the United States Bureau of Mines by refining and marketing companies, totaled 356,536,829 barrels, or 11 per cent less than the 401,209,692 barrels reported for 1930. Deliveries in 1929 were 423,572,930 barrels.

Northern States Power Adds 3,400,000 c. f. Load in September

Northern States Power Co., Minneapolis, Minn., reports that during September, 1932, 371 domestic gas contracts were closed by the company, with a total annual added load of 3,400,000 cubic feet. Thirty-five industrial and commercial gas contracts were closed during the month, and 128 gas ranges were sold during the period.

Childress Now District Headquarters for Northern Texas Utilities

Offices of the Northern Texas Utilities Co., Childress, Texas, have been moved into larger quarters, the town having been made district headquarters for six counties. G. L. Taylor is district manager for the company there, and M. J. Bretherton is local manager.

Death of Alexander H. Thorn of Peoples Company

Alexander H. Thorn, personnel director for the Peoples Gas Light and Coke Co., Chicago, Ill., died suddenly on October 11 at Atlantic City, N. J., while presiding at one of the sessions of the American Gas Association Convention.

H. H. Clark Now With Central Fuel Corp., Chicago

Horace H. Clark, vice-president of the United Public Service Co., Chicago, has left that position to become affiliated with the Central Fuel Corp., also of Chicago.

R. F. C. Loan Refused Wetumka

Officials of the city of Wetumka, Okla., received word recently that their application for a loan of $50,000 from the Reconstruction Finance Corp. to construct a municipal gas distribution system at Wetumka, has been denied.

Olive Hill Franchise to Gearhart

A. D. Gearhart has purchased the gas franchise at Olive Hill, Ky., effective November 10.

115 Appliance Dealers in These Northern California Communities Use Tie-in Advertising to Increase Sales

Alameda
Auburn
Berkeley
Biggs
Burlingame
Campbell
Ceres
Chico
Escalon
Eureka
Gonzales
Hayward
Healdburg
Larkspur
Lodi
Martinez
Marysville
Menlo Park
Modesto
Monterey
Napa
Novato
Oakland
Patterson
Pacific Grove
Petaluma
Placerville
Ripon
Sacramento
San Francisco
San Jose
Salinas
San Mateo
San Rafael
Santa Rosa
Stockton
Tracy
Vallejo
Willows
Woodland
Willow Glen

JUST ARRIVED
New CATHEDRAL Windsor Gas Circulating HEATER
FOR THREE LARGE ROOMS
$31.95 to $39.95
MONTGOMERY WARD & CO.
SEARS
SEARS ROEBUCK AND CO
Keep Warm Keep Well
Hercules Gas Floor Furnace!
$33.00
"SUPERIOR" RADIANT CIRCULATOR for Gas
It Radiates- It Circulates-
The H.C. SHAW Co.
ALL KINDS OF HEATING EQUIPMENT
PEFFER
NO DOWN PAYMENT
NO INTEREST
HE'S ALL RIGHT
this home is heated by Natural Gas
P·G·E·
PACIFIC GAS AND ELECTRIC COMPANY
$30 for your OLD Stove
$139.50
Wilson-Schulz & Co.
An investment in health and in Real Comfort
The New SPARK Gas Heater
Obtain the Greatest Amount of Heat With
FRASER CONSOLE HEATERS and Floor FURNACES
Clean, Economical heat... Let Us Give You an Estimate
W. T. GIBSON CO.

ARE YOU *One of the 115 Dealers Who Profit This Way?*

More than 115 Northern California dealers now use tie-in advertising to increase their sales. This is an increase of 200 per cent over the number of dealers who used tie-in advertising during February of this year. These dealers have learned by profit-making experience that tie-in advertising virtually doubles the value of their advertising dollars.

They know that each P. G. and E. advertisement creates and builds up public desire for gas heating appliances. Prospects are invited to visit dealers' stores. Unless these newly created prospects know WHERE to buy gas heating appliances, many possible sales will be lost.

The dealer who wants P. G. and E. advertising to produce sales for his store profits most by running his own advertisement in space adjoining that used by this Company. He thus gets the benefit of P. G. and E. advertising as well as his own. He identifies his place of business with the major gas heating campaign. The tie-in advertisement centers interest upon his store.

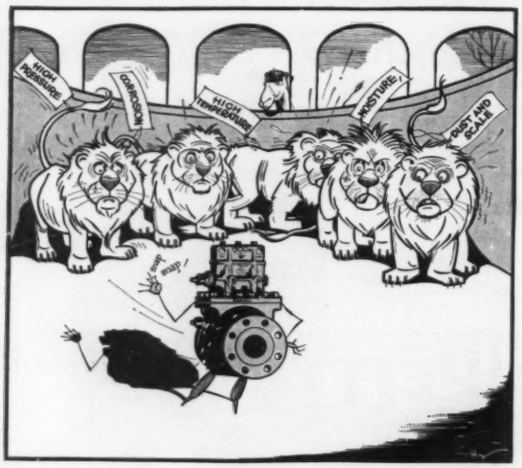
To increase your appliance sales as others are doing, tie in your advertising, sales plans, and displays with the major campaign.

WG 212-1232

P · G · and E ·

PACIFIC GAS AND ELECTRIC COMPANY

OWNED · OPERATED · MANAGED BY CALIFORNIANS



Daniel in the Lions' Den fears no punishment

Meets every condition

J. A. CAMPBELL CO.

Mfrs. of Gas Specialties and Voltz Regulators

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GAS APPLIANCES AND FURNACES

Announcing—

Two New Large Capacity

FLOOR FURNACES

No. 135 —50,500 B. T. U. Input
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The Complete Line now includes

7 sizes Floor Furnaces
11 sizes Basement Furnaces
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Baked or Porcelain Enamel

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"Antileke"

The hypo-sealed pipe joint saves 20% to 50% in laying cast iron or steel pipe and repairing any ordinary or difficult gas leaks.

Thousands in use without a single failure.

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San Antonio Public Service Stages Water Heater Show

San Antonio Public Service Co., San Antonio, Texas, has just completed a gas water heater sales campaign, during which 100 water heaters were sold. The campaign took the form of a Gas Water Heater Show covering a period of three weeks, planned by R. A. McNeese, sales promotion manager and R. E. Sivley, commercial manager. Mr. McNeese states that in addition to the heaters sold during the show an additional 300 good prospects were secured, many of whom will develop into "sales" during the coming months.

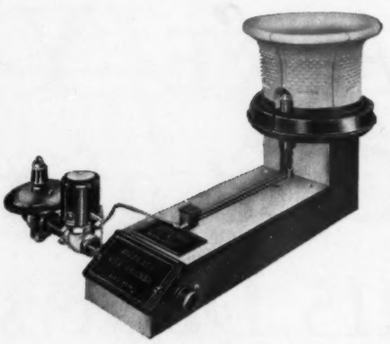
The show was conducted during the three weeks preceding November 15, on the sales floor of the Public Service Building, which was decorated in keeping with the water heater theme. Distributors of water heaters displayed their latest equipment in booths.

Before and during the campaign newspaper advertising and publicity was employed with excellent results, both from the sales standpoint and the good feeling generated among dealers, distributors and plumbers.

New Type Radiant Features Roberts Model

Roberts-Gordon Appliance Corp. announces application of a new principle of burner radiant design in its Roberts Standard burners.

The new Roberts radiants are self-supporting and no part of them comes in contact with the walls of the fire pot. The radiants remain in a fixed position.



The Roberts Standard burner will fit a large range of boilers and furnaces and the varying angles of fire pots do not need to be considered. The new radiant functions in a fire pot of any angle. Adjustment of burners may be made without the removal of radiants.

Guthrie Company Announces Lower Rates on November 10

The Western Service Corp., gas utility serving Guthrie, Okla., on November 10 obtained a reduction from 45 cents to 38 cents a thousand cubic feet to domestic consumers.

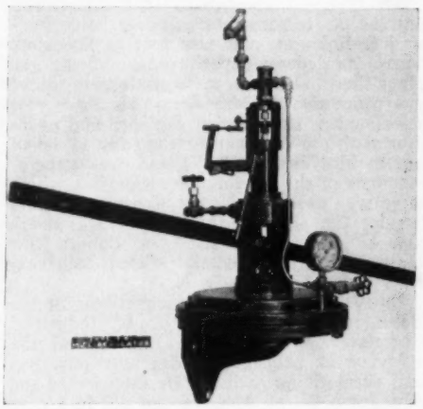
Kentucky Public Service Co. Moves Elizabethtown Offices

Kentucky Public Service Co., Elizabethtown, Ky., moved its offices to the Woelpert Building on November 1. The company holds a natural gas franchise at Elizabethtown, as well as several other towns in the district.

Morey & Jones, Ltd., Offers New "EK" Regulator to the Trade

Morey & Jones Ltd., Los Angeles, Calif., has developed a new type "EK" regulator, which is designed automatically to adjust fuel valves and/or dampers on all sizes of steam boilers, of either the gas or oil-fired types, in direct relation to steam pressure changes during changes of loads.

A pilot valve spring is set to balance the required boiler pressure which is exerted onto a diaphragm (or cylinder). As the pressure goes above the set point, steam



from the header or some constant-pressure fluid is admitted to exert pressure on the main regulator diaphragm (or piston in cylinder). When this latter part moves, an automatic compensating device acts to prevent "overtravel or hunting," thus avoiding further movement until it is required by further changes in the pressure conditions, or a reversed action is demanded.

These regulators are suited to handling steam pressures from 2 to 350 pounds per inch. The regulator arm movement may be varied over a wide range to suit various control conditions and mechanical movement needed.

New Book on Public Utilities By H. M. Robinson

"Public Utilities and the People" by Henry M. Robinson, of Dallas, Texas, was recently brought from the press. The book contains 18 chapters on the fundamental principles of the operation and management of public utilities. The chapters are entitled: What Is a Public Utility; Advantages of Public Utilities; What Produced the Public Service Commissions; Principles Under Which Utilities Are Regulated; Promoting the New Enterprise; Franchises; Value of Franchise; Franchise Rate Fixing; Present Fair Value; Fair Rate of Return; Maintenance, Depreciation, Obsolescence, and Depletion; Convenience and Necessity; Legal Aspects of Rate Regulation; Service to the Public; Understanding; Management; Municipal Ownership or Operation of Public Utilities; The Value of a Public Utility.

Dickson County Oil and Gas Co. Now Standard Gas Co., Inc.

The name of the Dickson County Oil and Gas Co., Nashville, Tenn., has been changed to Standard Gas Co. Inc., with plans announced for construction of a gas transmission line from fields in Dickson County to Nashville, a distance of approximately 25 miles. Stockholders voted a capitalization of $2,500,000 for the project recently.

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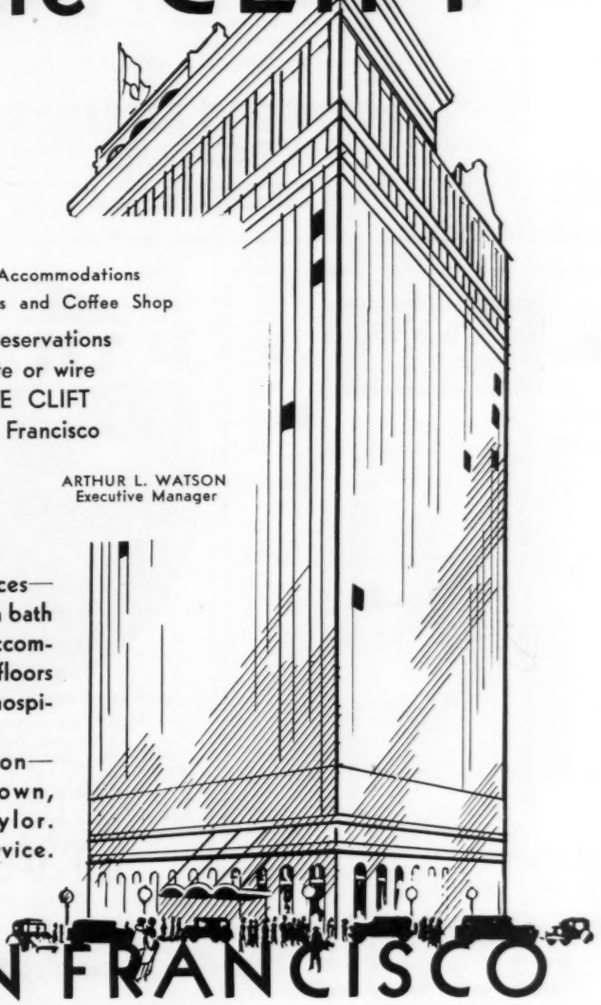

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Moderate prices—from $3.00 with bath—Modern Accomodations—16 floors of up-to-date hospitality.
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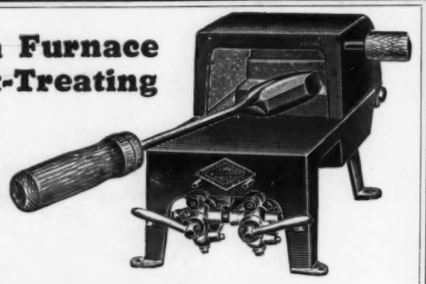
Personal Service.

SAN FRANCISCO

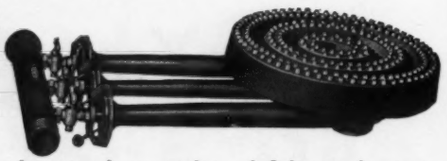
Johnson No. 101 Bench Furnace for Soldering and Heat-Treating

The Johnson No. 101 is one of the handiest and most powerful bench furnaces on the market. Unusually efficient for heating soldering coppers and heat-treating carbon steel tools and parts. Stout construction insures long, dependable service. No blower is needed. Write for details.



An All-Purpose Burner for Natural or Manufactured Gas

The Johnson No. 60BCE Ring Burner is one of the most flexible gas burners made. Composed of three individual ring burners, each with separate valve and mixer. They may be used separately or in combination. Very economical to operate because it eliminates unnecessary waste of gas. Write for the complete catalog of Johnson burners.



Johnson Torch and Melting Pot

This handy unit is known as the Johnson No. 8 Torch and Melting Pot. Combines many uses—heats soldering coppers, melts soft metals and the burner may be removed and used as an efficient hand torch. No blower is needed. Write for our catalog and see the low price on this unit.

JOHNSON GAS APPLIANCE CO.
Cedar Rapids IOWA

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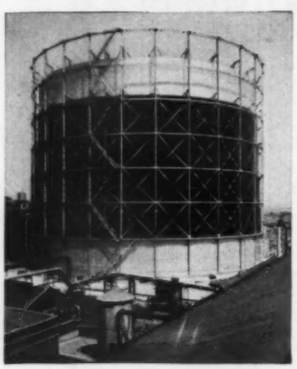
NO-OX-ID
IRON-RUST
The Original Rust Preventive



The Steel Beneath Safe From Rust

Modern lift and high pressure gas holders can be made impressively attractive to the eye and safeguarded against rust now as never before.

When NO-OX-ID FILLERS Red, Gray or Black are applied directly to the steel they form an excellent base for paint, still giving the long reliable protection for which NO-OX-ID is noted.

NO-OX-ID WATER SEAL also performs a valuable function in protection.

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When the pipe line takes the bends, it's Paranite that allows safe distortion at each coupling.

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The Manhattan Rubber Mfg. Division
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Wm. G. Von Gemmingen, Consulting Engineer, Passes

WILLIAM G. VON GEMMINGEN, consulting engineer of Eastland, Texas, died October 17 at his home. Mr. Von Gemmingen has been active in the gas industry for 20 years both as consultant and operating official. His offices were in New York.

Born 50 years ago in West View, Va., he was the son of Baron Sigmund Von Gemmingen, who came to this country before the Civil War. He was educated at Rock Hill College and in Germany at the University of Gottingen.

Mr. Von Gemmingen in 1910 accepted a position as construction engineer with Forstall & Robinson and was sent to Brockton, Mass., as general superintendent of the gas plant there. He also managed several other gas properties for this firm. He later was associated as construction engineer and operator with the engineering company of Isbell Porter in Newark, N. J., and was general manager of the Norfolk City Gas Co., which later was absorbed by the Engineers Public Service Co. During the war, he was operator of gas plants in Meriden, Conn.; New Haven, Conn.; Brockton, Mass.; Massena, N. Y.; and Schenectady, N. Y.

In 1918, Mr. Von Gemmingen was at the Baltimore plant of the U. S. Industrial Chemical Co. engaged in research on the recovery of potash, glycerine, tar oils, gas and decolorizing carbon. He then joined the Aluminum Co. of America and put in a new carbon and gas plant.

Joining Ford, Bacon & Davis in 1921, he was senior gas engineer for seven years. For three years before establishing his own consulting engineering practice, Mr. Von Gemmingen was with G. E. Barrett Co. as technical advisor on gas problems.

Among the pipe line projects with which he was associated in various capacities were the lines to Atlanta, Ga.; Salt Lake City, Utah; Kansas City, Mo.; El Paso, Texas; Monterrey, Mexico; Omaha, Neb.; Des Moines and Mason City, Iowa; Memphis, Tenn.; San Antonio, Texas; Baton Rouge and New Orleans, La., and Cincinnati, Ohio. Studies on the introduction of natural gas into manufactured gas territories were made for Omaha, Neb.; Cincinnati, Ohio; New Orleans, La.; Minneapolis and St. Paul, Minn.; Jersey City, N. J.; New York City, and Edmonton, Canada.

New Schedule of Rates Announced for Wellington, Texas

New gas rates for Wellington, Texas, were expected to go into effect there on November 20. The new rates are as follows: First 25,000 cubic feet per month, 40 cents per thousand cubic feet; next 75,000 cubic feet, 24 cents per thousand; next 100,000 cubic feet, 18 cents per thousand; next 200,000 cubic feet, 15 cents per thousand; for all gas used in excess of 400,000 cubic feet per month, 13 cents per thousand. A charge of one dollar per month minimum is provided, and a 10 per cent additional charge is allowed on all bills not paid within 10 days after being rendered to consumer.

Drumwright Franchise Voted to the Quackenbush Co.

Drumright, Okla., voted November 15 in favor of a gas distribution franchise for the Quackenbush Company. The company is reported to be planning to spend $30,000 in construction work there during the next four months.

New Publication on House Insulation Ready for Distribution

"House Insulation, Its Economies and Application," has recently been brought from the press by the National Committee on Wood Utilization of the United States Department of Commerce, being a report of the subcommittee on House Insulation. The booklet was distributed to members of the American Gas Association through the cooperation of Alexander Forward, managing director, and members of the committee.

The report contains a description and uses of house insulation, featuring the additional comfort obtained in summer and winter, and the saving in fuel costs in winter. Many photographs and diagrams are used, showing the various types of insulation for walls, floors and roofs. Illustrations and text also describe the proper methods of applying insulating materials.

The booklet may be obtained from the Superintendent of Documents, Washington, D. C., price 10 cents.

Clarksville Sales Crew of Community Natural Hangs Up Record

A sales record which has never been topped by any territory on the Community Natural Gas Co. properties was recently set by F. K. Collie, local manager at Clarksville, Texas, for the gas company, and his assistants, Miss Mary Lamb, cashier, and M. L. Pope. These three employees sold water heaters, ranges and space heaters in Clarksville from September 15 to October 16, in the amount of $3.75 per meter, and in their territory, including all of Red River County and part of Lamar County, they piled up a score of merchandise amounting to $2.56 per meter.

Franklin County Gas Co. Organized at Ottawa

Franklin County Gas Co. was recently organized at Ottawa, Kan., for the purpose of supplying natural gas to the municipal water and light plant at Ottawa. Supply for the line will come from a newly discovered field west of Ottawa. November 20 was the date set for completion of the line.

Cameron, Mo. to Have "Natural" On Completion of 20-Mile Line

Natural Gas from fields near Smithville, Mo., will be served in Cameron, Mo., shortly, according to a statement credited to C. D. Reynolds, holder of the Cameron franchise. A line will be constructed from the field to Cameron, a distance of over 20 miles, construction to begin immediately.

United Gas Public Service Co. In New Quarters at Crowley, La.

United Gas Public Service Co., headquartered at Houston, Texas, held formal opening of its new offices at Crowley, La., on November 10. P. H. Chaffin is district manager, Crowley being headquarters for Welsh, Jennings and Rayne, La.

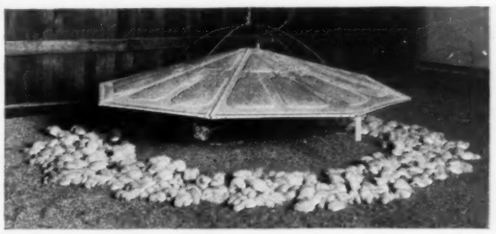
Chicago Gas Rate Decision Expected Sometime in December

Taking evidence in the Peoples Gas Light and Coke Co. rate case has been completed in Chicago by the Illinois Commerce Commission, which has requested that briefs be filed by December 20. Oral arguments will be heard December 27.

GAS BROODERS

The new type Hart Radiant Gas Brooders are causing a sensation amongst poultrymen. They are proving by far the best means of brooding chicks. Increase your sales of gas by handling this leading line. Hart Gas Brooders will raise a greater percentage of chicks with less labor and expense than any other method. All brooders thermostatically controlled—hang from ceiling—teach chicks to perch—gas pipe runs overhead with flexible gas tubing running to brooder. Get your share of the vast potential fuel load for brooding of chicks and turkeys. One poultryman is worth a dozen ordinary household gas consumers.

Send at once for descriptive literature, discounts, etc.



Flashlight photograph of chicks sleeping under a Hart Gas Brooder at the world's largest poultry ranch where Hart Brooders are used exclusively. One hundred and forty-four brooders in operation the year round brooding five hundred to one thousand chicks to the brooder.

H. W. HART MFG. CO., P. O. Box 404 W, Santa Monica, Calif.

More Hart Gas Brooders are being sold on the Pacific Coast than any other make.

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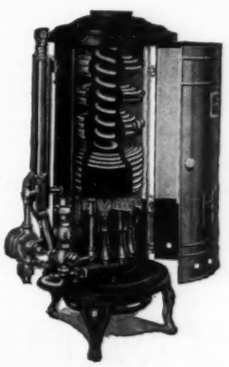

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Equipment for the manufacture, cleaning and handling of gas.
Equipment for the recovery and treatment of coal by-products.
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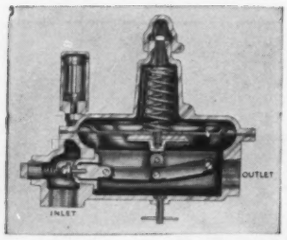

Reynolds Products—

Products for all kinds of Pressure Reduction—for either artifiicial or natural gas.

GOVERNORS—Intermediate Pressure, Triple Outlet, Holder, Toggle Type Street.

REGULATORS—High Pressure Service, Low Pressure Service, High Pressure Line, Single and Double District Station.

VALVE—Automatic, Quick-Closing Anti-Vacuum, Relief, Cut-off.

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Reynolds Gas Regulator Co.

Anderson, Indiana

422 Dwight Building—Kansas City, Missouri
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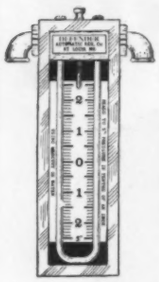

DEFENDER MANOMETERS

A Type for Every Purpose

Bulletin No. 38 illustrates 4 models in two lengths of these cover type U Gauges with 4 standard scales reading in Pounds and Ounces, Inches and Tenths using Water, Mercury, Red Oil or Tetrabromide for reading pressure Vacuum or differential in low pressure. Bulletin No. 36 illustrates a complete line of high and low pressure. Single and Double leg column Manometers with any type of scales for any purpose. We also make a complete line of Instruments and Regulators, including Combustion Control systems and Efficiency Instruments for Boilers.

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Most desirably situated on Wilshire Boulevard, adjoining beautiful Westlake Park---15 minutes from the city center. By bus directly in front of the building and by three car lines within one block.

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Apartments from $75 a Month
Also Daily and Weekly Rates

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Modern, Home-like and Supremely Comfortable

LOS ANGELES

Research Paper on Gas Burner Design Now in Pamphlet Form

RESEARCH Paper No. 446, "A Method for Determining the Most Favorable Design of Gas Burners," by John H. Eisseman, Elmer R. Weaver, and Francis A. Smith of the United States Bureau of Standards has been published in pamphlet form as a reprint from the Bureau of Standards Journal of Research, Vol. 8, June, 1932.

The conditions which limit the satisfactory operation of a gas burner in its relation to the appliance are briefly discussed in a general way. Definite limits may be determined which show the conditions under which the flames flash back or blow from the ports and those under which combustion is rendered incomplete or "carbonizing" flames are produced. The relationships between these limiting conditions and several of the more important details of design and adjustment of the appliance are shown for the typical case of the top burner of a gas range burning a carbureted water gas of 570 B.t.u. The effects of the more important possible changes on the efficiency and rapidity with which heat is transferred are also shown, and the most favorable combination of conditions is systematically developed. The effects of the allowances which must be made in design for anticipated variations of pressure and inaccuracy of adjustment are also shown.

An appendix describes the laboratory apparatus which has been developed for experimental work of the kind involved.

New Compound Makes Rubber Tubing and Hose Oil-Proof

A new compound, Paranite G.O.P. (gas-oil-proof), has been developed by the Manhattan Rubber Manufacturing Division, Passaic, N. J.

The Paranite G.O.P. compound is similar to rubber in appearance and physical characteristics. The base compound is a refined hydrocarbon sulphide known by the trade name of Thiocol.

The hose is lined with the G.O.P. compound either in pure form or combined with oil-resisting rubber, the amount depending on the severity of the service.

C. B. Ames Elected President A. P. I. at Houston Sessions

At the 13th Annual Convention of the American Petroleum Institute, held at Houston, Texas, November 17, C. B. Ames, vice-president of The Texas Co., Oklahoma City, was elected president. Mr. Ames succeeds Amos L. Beaty of New York City. W. R. Boyd, Jr., executive vice-president, was re-elected, as were all the other officers.

Thomas K. Bishop, New President of Wyoming Gas Co.

Thomas K. Bishop has been made president of the Wyoming Gas Co., Basin, Wyo., taking the place left vacant by the death of E. A. Durham. Mr. Bishop has been with the company for several years in the capacity of treasurer. W. C. Feddersen, purchasing agent, has been named to succeed Mr. Bishop as treasurer.

Texas Border Gas Co. Changes Name

The Texas Border Gas Co., Laredo, Texas, will hereafter operate under the name of United Gas Public Service Co. The company has been a subsidiary of United for the past two years, though operating under its own name.

Roper Corp.'s Selling Plan for Custom Made Gas Ranges

Roper Corp., Rockford, Ill., has developed a selling plan whereby "Roper Custom Gas Ranges" may be obtained by the purchaser to suit the decoration motif and color of the kitchen, at a slight additional cost. The company will follow a sketch submitted by a housewife showing the color and trim desired, and if at a later date the family moves to a new house where a change in color scheme is desirable, the range will be made to match the new color plan by changing the trim.

As an introductory measure, to arouse interest in custom gas ranges, utilities were asked to sponsor contests among employees for the best designs. The winning designs were made up by the manufacturer and used by the utility for display purposes. One company sponsored a city-wide design contest, wherein the winner of the contest was presented with a range made up according to his own design.

Municipal Gas Co. Opens New Office at Hillsboro, Texas

November 30 was the date set for the formal opening of new offices for Municipal Gas Co., Hillsboro. Texas, subsidiary of Lone Star Gas Co., Dallas.

The new office is located at 209 East Elm St., and is equipped with spacious display quarters. Townspeople were invited to the opening, during which a pie baking contest was held. The winner of the contest was presented with a cabinet type gas range with an 18-inch oven. Second prize was a set of gas logs and andirons. An interesting condition of the contest was that the ingredients should not cost more than 37 cents.

Eldor L. Buelow is manager for the company at Hillsboro.

Southwestern Gas & Pipe Line Co. Constructing Line to Eden, Texas

Southwestern Gas & Pipe Line Co., Fort Worth, Texas, has been given the contract for supplying Eden, Texas, with natural gas. The new transmission line will be approximately 20 miles long, and will serve Millersview and Eden, with a lateral to Melvin. On completion of the main line, laterals will be constructed to Eola, Paint Rock and Menard. F. B. Spence, of Coulson & Spence, holds the distribution franchise at Eden, and is constructing a system there.

Illinois Gas Development Pioneer Passes November 10

E. Stephenson, pioneer of the natural gas industry in Illinois, died at Amboy, Ill., November 10, at the age of 60. Mr. Stephenson was a pioneer operator in Lee County, having brought in the first gas well in that vicinity.

Davenport Change-Over Delayed

Change-over of the Davenport, Iowa, system of the Peoples Light Co., scheduled for early December, will be postponed until the completion of a rate survey being conducted by engineers at the request of the Davenport City council.

Good Designing has..... Brought Better Regulation

Fulton Duplex Sensitive Vacuum or Back Pressure Regulator

C-F

REGULATION has so vital a part in service that any equipment or method by which regulation is made easy and sure must be recognized as important.

The designs of Chaplin-Fulton regulators have been developed through many years of research and use. In C-F designs, simplicity, sturdiness, and accessibility of parts have been provided for to a very high degree.

There are many types of C-F regulators, each suited for a particular range of requirements, each commanding confidence by its record of satisfactory service. Correspondence is invited. A catalog will be mailed on request.

CHAPLIN-FULTON REGULATORS

The Chaplin-Fulton Mfg. Company

Organized 1884—Oldest Builders of Gas Regulators in the Country. Regulators of all Sizes, from 1 inch to 24 inches; for all Service, 1 oz. up to 2,000 lbs. pressure to Square Inch.

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The Goodman Stopper

GOODMAN USED SINCE 1897 2" HANDLE & LOCKING SLEEVE GAS MAIN STOPPER

The Reliable Shut-off for Street Mains

Equipped with Improved Patented Locking Sleeve, which locks both handles to the pipe. Stopper cannot slip. Gas cannot pass.

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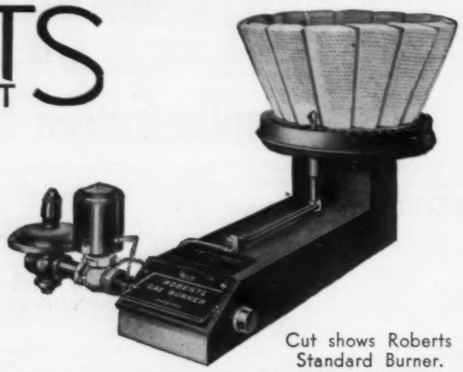

Cut shows Roberts Standard Burner.

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North Shore Gas Co. Adopts Rental Plan for Conversions

North Shore Gas Co., Winnetka, Ill., is introducing to its customers the sales-rental plan for the installation of conversion gas burners for house heating. The burner will be installed on a rental basis. At the end of the first year, the gas burner may be purchased either for cash or on terms, with the full amount of the rental paid during the year applying on the purchase price. The company now distributes mixed natural and manufactured gas, the natural supply coming from the main line of the Natural Gas Pipe Line Co. of America, Chicago, Ill.

New Line to Serve Lime Co. at Peirce City, Mo.

Ozark Distributing Co., Monett, Mo., recently completed the construction of a gas transmission line to the Peirce City Lime Co. plant at Peirce City. The lime company will begin using gas service about January 1. The work was completed under the direction of H. L. Siebenthaler, manager of Ozark Distributing at Monett.

— *ANNOUNCEMENT* —

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For a Fixed Monthly Charge

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SAFETY GAS SHUT-OFF

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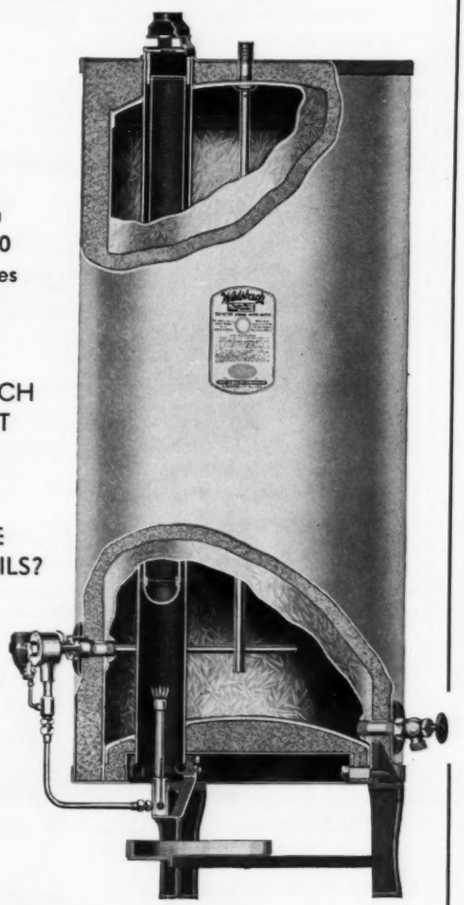

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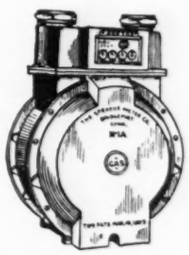

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now reaches its highest peak of development in the new ROPER *Insta-Matic*

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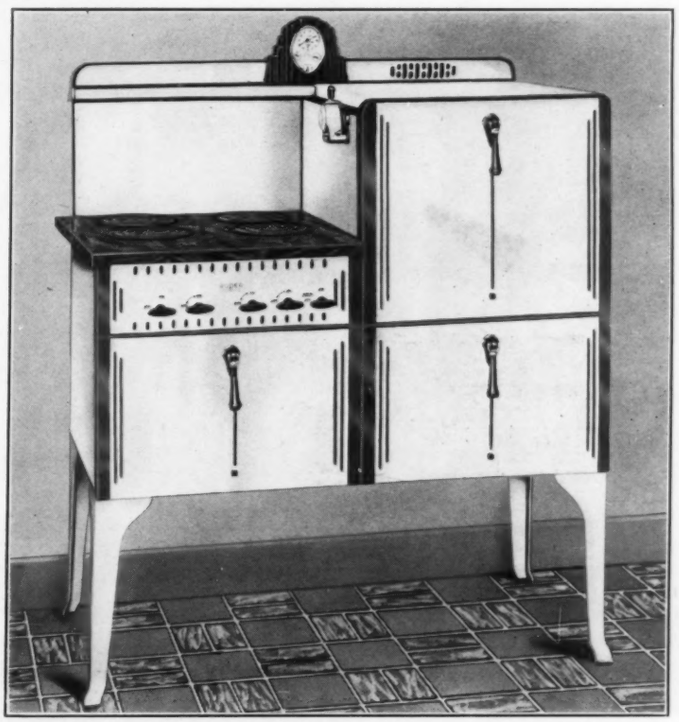

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For further information write to The Cast Iron Pipe Research Association, Thomas F. Wolfe, Research Engineer, 309 Peoples Gas Building, Chicago, Ill.

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